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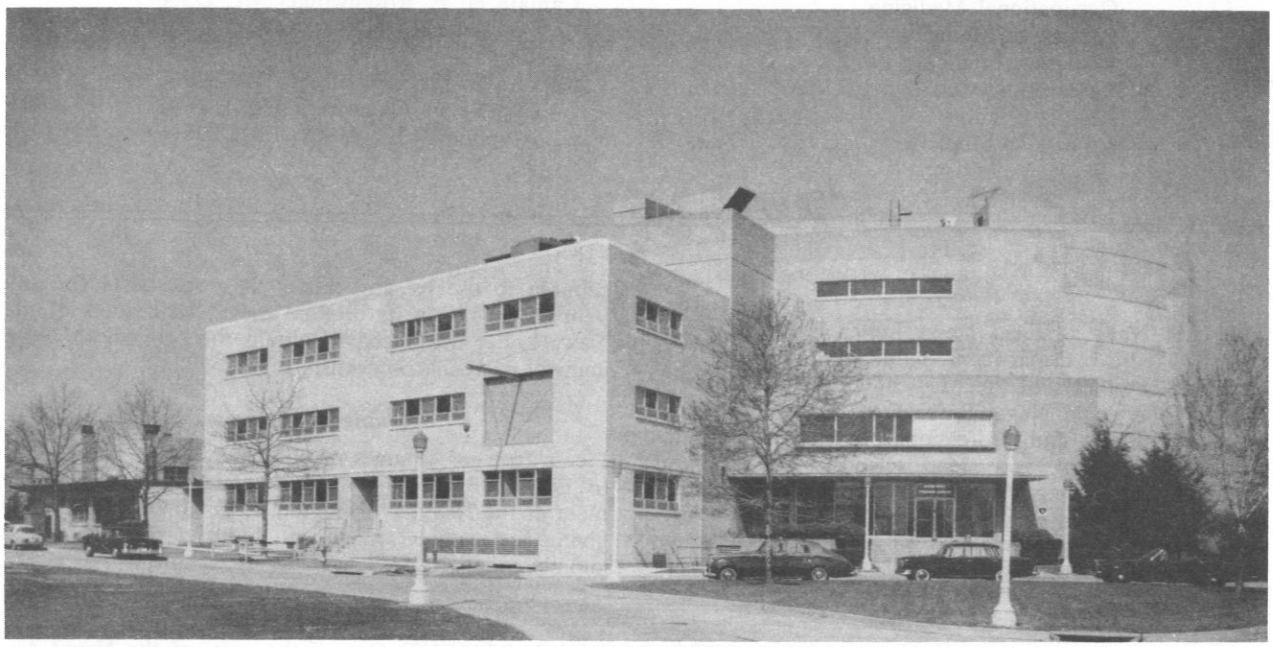

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article, in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to Editor: Bureau of Medicine and Surgery, Department of the Navy, Washington, D.C. 20390 (Code 18), giving full name, rank, corps, old and new addresses, and zip code.

FRONT COVER: AEROSPACE MEDICAL RESEARCH DEPARTMENT. One of the units of the Naval Air Development Center at Johnsville, Pa., near Philadelphia, is the Aerospace Medical Research Department. This Department was established 29 February 1952 as a subunit of the Aviation Medicine Acceleration Laboratory. One of the more prominent features of the research unit is a huge centrifuge. Used for the reproduction of acceleration stresses, it simulates those likely to be encountered in jet aircraft and various space vehicles. Until recently, this was the only available device capable of providing astronauts with preflight experience in the accelerations necessary for space travel. The development of high-altitude, high velocity aircraft has led to the necessity for predetermination of effective human physiologic limits to insure equally high performance criteria under all possible conditions. The staff of the Aerospace Medical Research Department has developed many devices and facts to study the potential hazards of aviation. Those hazards have been reduced materially as a result of preflight testing. Valuable studies that have been conducted include those in relation to antiblackout equipment, the biochemistry of stress situations, the effects of zero gravity and the mechanisms of visual alertness. The safe and successful completion of a flight in an aircraft or space ship is dependent upon the pilot's ability to actuate the controls of the vehicle. Tolerance to acceleration stresses, the shock of emergency ejection and the high-intensity noises and heat are some of the studies that are being made. The Mercury, Gemini and Apollo earth orbiting flights were preceded by studies and astronaut training at Johnsville. In 1962, research was conducted on human ocular reactions and muscular movements during simulated flights. More recent studies have been directed toward all sorts of safety and protection devices. Among these are protection from thermonuclear radiation, the prevention of flashblindness and the study of escape systems, bio-analytics, and cardiovascular effects. Continuing studies include the biochemistry of stress, neurochemical control mechanisms, and vestibular function.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

GLAUCOMA DETECTION: RESEARCH REPORT AND RECOMMENDATIONS

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Within the past 10 years, much emphasis has been placed upon the optometrist and ophthalmologist to make a special effort to detect glaucoma and its symptoms. This article is prompted by a research project conducted in December of 1965 at the United States Naval Dispensary in Washington, D.C. It has been observed that the procedure of obtaining tonometric readings varies at different eye clinics concerned with the detection of glaucoma. In some clinics, no special techniques such as measuring the intraocular tension or the plotting of visual fields have been established as routine.

In view of recent attitudes toward glaucoma detection, this matter was brought to the attention of authorities in the Bureau of Medicine and Surgery. It was proposed that a study of newer methods of intraocular pressure measurement be made and compared with the commonly used method of Schiotz tonometry within a busy naval eye clinic.

Duke Elder states that glaucoma does not connote a disease entity. His book states, "It embraces a composite congeries of pathological conditions which have as a common feature that their clinical manifestations are to a greater or less extent dominated by an increase in the intraocular pressure which the tissues of the particular eye in question are unable to withstand without damage to their structure or impairment of their function." [1]

The question now arises as to the methodology of detection of glaucoma which might be utilized in order to obtain maximum effectiveness with a minimum of time expended. The instrument usually utilized for "mass screening" is the Schiotz tonometer. Recently, questions have arisen concerning the accuracy of the Schiotz instrument, even in the hands of ophthalmologists. According to Smith, there are doubts as to the accuracy of the Schiotz method as compared to the applanation method.[2]

It may be assumed that the Goldmann applanation tonometer, which is of recent origin, is the most accepted instrument for accuracy of the measurement of the intraocular tension. The accuracy depends upon the skill of the person using it. This method takes more time than the Schiotz. It also requires the use of a topical anesthetic. In view of the fact that the optometrist examines a great many patients and does not use any anesthetic, this method does not readily lend itself to "mass screening" without medical supervision.

The MacKay Marg electronic tonometer uses a small probe with a sterile rubber tonotip which touches the cornea. A drop of sterile contact lens wetting fluid is placed on the edge of the sterile rubber tip and actually there is very little feeling to the cornea when the fluid touches the cornea. The tonometer tip measures 5 to 6 mm and the touch of the probe is only a fraction of a second. The Schiotz plate is metal and measures 10 mm in diameter. It is necessary to anesthetize the cornea and hold the Schiotz in balance on the cornea while the reading is taken. There is virtually no danger of abrasion with the MacKay Marg and there is some danger of abrasion using the Schiotz.

The validity of the MacKay Marg Electronic Tonometer has been demonstrated by several research projects. The Journal of Investigative Ophthalmology reported research by Moses et al indicated a high correlation between the MacKay Marg and the Goldmann Techniques. A coefficient of 0.93 was found on tests utilizing the Goldmann first and

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MacKay Marg second, and 0.96 when utilizing the MacKay Marg first and Goldmann second.[3]

In August 1966, Tierney and Rubin reported results which they obtained on a number of patients when using all three methods of intraocular pressure measurement. The report indicated that several factors could be relied upon:

"In performing tonometry with the MacKay Marg instrument, several potential advantages over conventional tonometry are noted:

1. The MacKay Marg tonometer is largely independent of such variables as ocular rigidity, corneal diameter and surface tension.

2. Readings can be made quickly, and are thus easy to take on children (and laboratory animals).

3. The machine is portable.

4. A permanent record is made of the pressure tracing for future reference.

5. Known errors in the application of the instrument tend to give a higher normal estimate of intraocular pressure; thus in glaucoma screening, false positives are more likely than false negatives.

In this study, estimates of intraocular pressure, as made by MacKay Marg tonometry compared favorably with those made with conventional Goldmann Applanation.[4]

Drs. Hilton and Shaffer made a comparison of findings between MacKay Marg and Goldmann applanation methods. This was done at the Department of Ophthalmology of the University of California. Ocular tension was measured on 64 eyes of 32 patients by the Goldmann applanation technique and the MacKay Marg technique. The published paper states, "The measurements were plotted on a scattergram. Inspection reveals a good correlation between the two methods. The differences revealed by such a plot are not statistically significant."

The summary of this project is stated as follows: "The MacKay Marg tonometer has been compared with the Goldmann tonometer in the measurement of human autopsy eyes, with manometric control, and has been found to compare favorably. A series of 64 eyes have been measured clinically by both instruments and a high correlation has been found, if only the lower values recorded by the MacKay Marg instrument are considered as valid. While there is some difference when the instrument is used without topical anesthesia, this is not statistically significant." [5]

The writers of this report did not have these last two references when it was proposed that a comparison be made in a Navy eye clinic of the MacKay Marg and Schiotz techniques. The project was set up at the Naval Dispensary Eye Clinic in Washington during two weeks active duty for training for one of the writers. The procedure was incorporated into the regular schedules of the optometry staff and the ophthalmologist on board. All persons over 40 years of age were tested with both Schiotz and with MacKay Marg instruments. The MacKay Marg procedure was accomplished first without topical anesthesia. All tests were made by two men; that is, one using the MacKay Marg instrument and the other using a Schiotz tonometer with topical anesthesia. There were several objectives in mind:

1. Patient's reaction to the methods, and concern for detection of glaucoma.

2. Reaction as to sensitivity of topical anesthesia.

3. Rapidity of one test as compared to the other.

4. Validity of tests as compared one with the other.

5. Determination as to number of "suspects".

This table shows that the correlation between the two eyes is high when measurements are taken by the same instrument. 0.89 with the MacKay Marg and 0.85 when taken by the Schiotz.

TABLE 1

X	Y	N	$\overline{X}$	STDVX	$\overline{Y}$	STDVY	r
1	2	205	22.38	3.38	22.25	3.51	0.8908
3	4	201	18.39	3.08	18.10	2.75	0.8507

Comparison of tonometric measurements as recorded by the MacKay Marg tonometer and Schiotz tonometer.

TABLE 2

X	Y	N	$\overline{X}$	STDVX	$\overline{Y}$	STDVY	r
1	3	199	22.40	3.42	18.37	3.08	0.5797
2	4	199	22.38	3.55	18.08	2.76	0.6145

Comparison of tonometric measurements as recorded on MacKay Marg and Schiotz.

Note the correlation between the two methods on the right eye (1 & 3) is only .57, while the comparison as found on the left is 0.61.

Key to Tables

Variable 1—MacKay Marg reading for right eye, without anesthesia

Variable 2—MacKay Marg reading for left eye, without anesthesia

Variable 3—Schiotz reading for right eye, with topical anesthesia

Variable 4—Schiotz reading for left eye, with topical anesthesia

N—number of eyes checked

X—right eye

Y—left eye

STDV—Standard deviation of high and low readings from mean reading

$\overline{X}$—mean of tonometric measurements for right eye

$\overline{Y}$—mean of tonometric measurements for left eye

r—coefficient of correlation between readings

It was decided to work as many of the "suspects" as possible into the schedule of the ophthalmologist in order that comparisons be made with the Goldmann Applanation technique. This proved to be unsatisfactory due to the large number of suspects found and interference with the regular workload of the ophthalmologist. The number of eyes checked with the MacKay Marg and Schiotz instruments was 199. Only 16 were followed up by the Goldmann Applanation instrument as noted above. The data were processed by a staff biostatistician of Biotronics, Inc., of California.

We have to assume that the MacKay Marg instrumentation is more accurate than the Schiotz based on the findings of Moses et al [3] and Rubin and Tierney [4], since these reports show that the Goldmann Applanation method and the MacKay Marg have a high correlation.

This table 2 would mean that findings with the Schiotz would show that some patients may be overlooked as glaucoma "suspects", while the MacKay Marg readily picked these "suspects" up. Over 6 times more suspects were found with the MacKay Marg instrument than with the Schiotz tonometer during the two weeks study.

From the findings of Moses et al,[3] and Rubin and Tierney [4] and Hilton and Schaffer,[5] it may be assumed that the Goldmann and MacKay Marg instruments have a high correlation. We may also note that the findings in this project show the Schiotz method may be overlooking some glaucoma "suspects."

In view of the study, let us consider the objectives again:

1. Patient reaction—In general patient reaction was excellent. Only two could not be tested without a corneal anesthetic using the MacKay Marg instrument while four would not allow a test by the Schiotz, even with a topical anesthetic. It should be noted that there is a reduction of possible infection with the MacKay Marg instrument due to the use of a disposable rubber tip which is sterile before use. There is no possibility of irritation and/or reaction from sensitivity to a topical anesthesia.

2. Rapidity of testing—It was found that patients could be tested rapidly and accurately by using the MacKay Marg instrument. Approximately three patients could be tested with the MacKay Marg instrument in the time needed for Schiotz tonometry.

3. It was found that resultant findings were usually higher with the MacKay Marg than with the Schiotz; thus false positives may be obtained but they provide an extra "safety margin." The results concurred with those findings of Rubin and Tierney. In other words, the optometrist would find more suspects to refer using this method, and it may be assumed that he would refer patients who were in the "gray zone" of increased intraocular tension as well as those with early glaucoma. It may be noted that the readings of the MacKay Marg instrument were consistently higher by about 4 mm than those obtained with the Schiotz instrument. This is consistent with other findings previously reported (Tierney and Rubin as well as Moses et al).

4. The validity of the tests are reported above as correlation coefficients. In the right eye the MacKay Marg instrument and the Schiotz instrument has a correlation of .5797; in the left .6145.

5. The Schiotz procedures resulted in eight suspects. Over six times as many suspects were found with MacKay Marg instrument than with Schiotz. The MacKay Marg instrument definitely found more patients showing high intraocular tensions as compared to the "norm." This would provide for earlier referral to the ophthalmologist and we would expect a greater number of determinations of early glaucoma.

The disadvantages to the use of the MacKay Marg are concerned with initial cost of the instrument as well as the cost of purchasing the sterile rubber tonotips. The instrument is very sensitive and does require calibration often.

Summary

The purpose of the project was to determine the value of the MacKay Marg electronic tonometer in a military eye clinic. It was found that this instrument showed consistently higher readings than the Schiotz on the 199 eyes checked. This is consistent with other investigators' results. Considerably more eyes were classed as "suspects" by the MacKay Marg technique than with Schiotz. Review of other works indicates that there is a high correlation between the Goldmann and MacKay Marg techniques, and that the MacKay Marg instrument usually showed a somewhat higher reading but was consistent.

Recommendations

Each person over the age of 40 be given an annual eye examination to include a thorough history, careful measurements of the intraocular tension be determined and that the MacKay Marg tonometer be considered as a possible instrument for mass screenings for glaucoma as well as for routine use in the eye clinic.

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Note: Biotronics, Inc., of California manufactured the MacKay Marg Tonometer and loaned it to the Navy Department for this project. The data were processed at the University of California.

EXPERIENCES WITH MECKEL'S DIVERTICULUM

Carl P. Schlicke, MD FACS and Edward V. Johnston, MD FACS, Spokane, Washington, Surg Gynec Obstet 126(1):91–93, January 1968.

It is well known that Meckel's diverticulum is a developmental remnant of the vitelline or omphalomesenteric duct. This connection between the yolk sac and the fetal intestinal tract is ordinarily obliterated by the fifth to the seventh week of embryonic life after which it undergoes atrophy and disappears. Failure of some phase of this process to take place may result in a residual fibrous cord, an umbilical sinus, an omphalomesenteric fistula, an enterocyst, or, more commonly, the pouch referred to as Meckel's diverticulum. When present, this structure is usually situated within 2 to 3 feet of the ileocecal junction and is found on the antimesenteric border of the small intestine. It is invariably accompanied by a characteristic blood vessel arising from the mesentery of the intestine. A number of complications may occur from the presence of Meckel's diverticulum. These complications are most often related to its presence as a band or a blind pouch. Less frequently, ectopia occurs which leads to a troublesome condition. In rare instances, a neoplasm is found.

From the Department of Surgery, Rockwood Clinic, Spokane, Washington.

"By Permission of Surgery, Gynecology & Obstetrics."

Material

During a 13 year period, 1954 through 1966, Meckel's diverticulum was found in 90 patients admitted to Sacred Heart Hospital. The ages of the patients ranged from 3 weeks to 75 years; 46 of the patients were females and 44, males. Two of the diverticula were found at autopsy; 56 were incidental findings at laparotomy. In many of these patients the predominant symptom was abdominal pain, and, in some instances, the diverticulum may have been the cause. However, in most instances

the diverticulum was removed during an operation performed for some other reason. Of the 32 diverticula which were definitely symptomatic, 9 were acutely inflamed or gangrenous; 4 of these had perforated, with resulting generalized peritonitis. Five patients had massive gastrointestinal bleeding: Ulceration of the mucosa was present in all, but ectopic gastric mucosa was found in only 2 patients. Eighteen patients underwent operation for acute intestinal obstruction due to the diverticulum. In 11 of these patients, a volvulus or internal hernia was present. In 6 patients, intussusception had occurred. In 1 patient, a strangulated Littré hernia was found.

Treatment

In 73 patients, the diverticulum was excised, and the edges of the resulting opening in the intestine were sutured together. In 1 patient, simple ligation of the base was carried out, and in 1, the opening was closed with a purse-string suture. Excision not only accomplished removal of the diverticulum but, in many patients, also relieved the obstruction to which it had given rise or, after reduction of intussusception, eliminated its cause.

In 11 patients it was necessary to remove a segment of the intestine as well as the diverticulum because of the condition of the diverticulum or the impaired viability of the intestine. In 1 instance, the diverticulum was exteriorized for decompression of the small intestine in a patient with completely obstructing carcinoma of the rectum upon whom a transverse colostomy was also performed. In 1 patient, the diverticulum was left in place after reduction of the intussusception.

Pathologic Findings

In most instances in which the tissue was recognizable, the diverticulum was lined by small intestinal mucosa. In 4 patients, gastric mucosa also was present. In 2 of these patients, aberrant pancreatic tissue was encountered, as it was in 2 others in whom gastric mucosa was not found. In 1 of the former, colonic mucosa also was present. In 1 patient, the diverticulum was the site of an argentaffin carcinoma. This finding was in a 76 year old white male who had undergone cholecystectomy for calculus cholecystitis. At operation, a Meckel's diverticulum was encountered and removed. The specimen measured 6 by 1½ centimeters. A flat nodule about 1 centimeter in diameter was present in its wall. Microscopic examination revealed that the diverticulum was lined with typical, small intestinal mucosa. The nodule proved to be an argentaffin carcinoma. There was no lymph node involvement.

Results of Treatment

In this series, there were 2 postoperative deaths. A 5 month old male infant, in whom an extensive ileocolic intussusception was reduced without resection of the intestine or removal of the diverticulum, died of peritonitis on the fifth postoperative day. Regrettably, the other death occurred in the patient with argentaffin carcinoma who died from acute hemorrhagic pancreatitis and congestive heart failure on the day after operation. Results of postmortem examination revealed no evidence of residual tumor. All of the remaining patients recovered.

Comment

When one considers the serious complications which Meckel's diverticulum may produce it might seem advisable to carry out routine exploration of the small intestine whenever the opportunity presents and to always remove Meckel's diverticulum when found. Six of the 21 patients reported by Root and Baker in whom the condition was considered a problem might have been spared serious complications had these suggestions been followed. Yet, routine exploration of the small intestine is not common practice at laparotomy, and even as meticulous a surgeon as Claussen believed it inadvisable, unless the symptoms incriminated this organ. The incidence of Meckel's diverticulum in autopsy material ranges between 0.2 and 3 percent, so the yield will not be great. Furthermore, one cannot but wonder about the legal implications. If under the doctrine of informed consent one can be held legally liable for carrying out incidental appendectomy if something goes awry, the risk might be even greater in carrying out a decidedly more formidable prophylactic maneuver. Possibly, it is preferable to maintain an awareness that Meckel's diverticulum may occur and may, on occasion, be responsible for serious trouble but that excessive manipulations should be avoided unless no other cause for the symptoms is apparent.

It would appear that about only 30 patients have been reported with carcinoid tumor of Meckel's diverticulum. Usually, these tumors are regarded as a low grade cancer, but metastasis was noted in 6 of the 27 patients referred to by Doyle and Severance, and 2 of these exhibited the so-called carcinoid syndrome. These rare tumors arise from the

Kulchitsky cells in the base of the crypts of Lieberkühn. They occur most commonly in the appendix, then in the small intestine, but they may also occur in the stomach, duodenum, colon, and rectum. When metastasis occurs elevated levels of serotonin may be present in the blood and cause flushing, syncope, hypertension, lesions on the right side of the heart, and diarrhea. The diagnosis is readily confirmed by the identification of 5-hydroxyindoleacetic acid in the urine. Leiomyosarcoma is said to be the most common malignant tumor found in Meckel's diverticulum.

Summary

The recorded experiences with 90 patients with Meckel's diverticulum were reviewed. In 35 percent of the patients, the diverticulum was unequivocally responsible for the symptoms. Complications which gave rise to symptoms were inflammation of the diverticulum, bleeding secondary to ulceration within the diverticulum, or intestinal obstruction due to the diverticulum. An additional, but rare, finding was the single instance in which an argentaffin carcinoma was present in the wall of the diverticulum.

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(The figures may be seen in the original article.)

PRIMARY MANAGEMENT OF HODGKIN'S DISEASE*

Alan C. Aisenberg, MD,† New Eng J Med 278(2):93–95, Jan 11, 1968.

With the rapid evolution of ideas on the pathogenesis and primary treatment of Hodgkin's disease, it is difficult for the physician who sees only an occasional case to maintain a coherent view of management. This article attempts to provide this view: the concepts presented here form the basis of the management of Hodgkin's disease in the Lymphoma Clinic of the Massachusetts General Hospital. Two recent symposia contain the major portion of available knowledge about this disorder and should be consulted for details.

Fundamental to all attempts at curative treatment of Hodgkin's disease is the assumption that in a significant fraction of cases the process is localized at the time of diagnosis. In support of this a number of radiotherapy centers now report that more than 50 percent of patients with localized disease survive for five years. The data of Peters indicate that a substantial percentage alive at five years remain well ten, fifteen and twenty years after irradiation treatment, and Easson has shown that after the tenth year the survival of irradiated patients with localized lymphoma approaches that of a control population of the same age. In addition, Rosenberg and Kaplan have recently demonstrated that new areas of involvement after irradiation therapy of the localized form of Hodgkin's disease were immediately adjacent to the treated areas in more than 80 percent of patients, suggesting that, in most cases, spread is contiguous and predictable.

Staging, based upon the extent of disease, is central to any consideration of treatment or prognosis in Hodgkin's disease. The following classification, adopted by the symposium held in Rye, New York, in 1965, has many advantages:

Stage I: disease limited to the lymph nodes of 1 anatomic region (subgroup 1) or to 2 contiguous anatomic regions (subgroup 2), on the same side of the diaphragm.

Stage II: disease in more than 2 contiguous or in 2 noncontiguous regions on the same side of the diaphragm.

Stage III: disease on both sides of the diaphragm, but not extending beyond the involvement of lymph nodes, spleen or Waldeyer's ring.

Stage IV: involvement of the bone marrow, lung parenchyma, pleura, liver, bone, kidneys, gastrointestinal tract or any tissue or organ *in addition to* lymph nodes, spleen and Waldeyer's ring.

All stages are divided into A and B by the absence or presence respectively of systemic manifestations,

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defined for the present purposes as fever, night sweats and pruritus. Hodgkin's disease primarily involving nonlymphoid organs is excluded from this classification.

Proper staging requires a careful history and physical examination, complete blood counts, urinalysis, radiograms of the chest (tomography in the presence of mediastinal lymphadenopathy), skeletal survey, liver-function tests (at least alkaline phosphatase) and lower-extremity lymphangiography. It has been amply demonstrated that no diagnosis of localized Hodgkin's disease (Stage I or II), particularly in the presence of systemic manifestations, is secure without a negative lymphangiogram. Thus, 50 to 90 percent of lymphangiograms on persons with systemic manifestations, who by clinical criteria are in Stage II (Stage II B), reveal retroperitoneal-lymph-node involvement, and such nodes are regularly found in Stage I cases appearing in inguinal nodes. Since intravenous pyelography detects only a small fraction of Hodgkin's disease involving the retroperitoneal nodes, lymphangiography is recommended at present for all Stage I and II cases. The contraindications to this procedure include allergy to iodized oils, parenchymal pulmonary disease and clinically advanced abdominal-lymph-node involvement. Radiography of the inferior vena cava may occasionally replace or supplement lymphangiography for the evaluation of lymph nodes in the upper abdomen. Because the lymphangiographic criteria of early lymphomatous involvement are still being defined, it must be expected that supplemental lymph-node biopsies will occasionally be required to establish the extent of the disease. In addition, in Stage III-B Hodgkin's disease, if radical radiation therapy is under consideration, a bone-marrow biopsy should be performed, and bone-marrow aspiration is always helpful in the evaluation of early stages of lymphoma of other than Hodgkin's type. Similarly, a needle biopsy of the liver may be useful to evaluate liver enlargement or abnormal liver chemical findings.

The significance of proper staging will be appreciated from the difference in five-year survival, which approximates 75 to 80 percent for Stages I and II, and is less than 10 percent for Stage IV. It should be further pointed out that a large fraction of the patients with Stage I and II disease who survive for five years will remain free of their disease at ten and twenty years, whereas almost all those with Stage IV disease eventually succumb to their disorder.

Two histologic variants, both associated with a favorable prognosis and frequently localized, should be mentioned. The first is the paragranuloma type of Jackson and Parker, which constitutes some 5 to 10 percent of the entire population with Hodgkin's disease and appears to enjoy a five-year survival rate of about 90 percent. The second variant, the nodular sclerosing type recently described by Lukes and Butler, frequently presents as localized disease of the lower neck and upper mediastinum. In a recent series 40 percent of long-term survivors presented with this histology. However, even though many long-term survivors demonstrate this variant, the survival rate with nodular sclerosis is not high (15 percent) because fully one third of the entire population with Hodgkin's disease shows this picture. In connection with prognosis the very poor outlook of Hodgkin's disease in the elderly should be mentioned; beyond the age of fifty ten-year survivals are unusual in all series.

There are 2 separate and distinct goals in the management of Hodgkin's disease. The first is cure, a goal that can only be achieved in a fraction of those with the disorder. The second is amelioration of symptoms, which can be achieved with regularity, but unfortunately may not be accompanied by major prolongation of life. If the 2 goals are confused, the maximum therapeutic possibilities will not be realized. In localized Hodgkin's disease (Stage I and II) treatment is directed to cure, whereas in Stage IV, cure is usually impossible because the involved organs will not tolerate curative amounts of radiation. Stage III forms an intermediate group in which the possibility for cure has been neither proved nor ruled out.

For localized lymphoma, radiotherapy with intent to cure is the treatment of choice. Surgery is best restricted to diagnostic biopsy and to resection of certain rare lymphomas arising outside the lymphoid organs. Such radiotherapy can be effectively administered only with megavoltage equipment, and even some megavoltage units (the smaller cobalt machines) will not permit fields of sufficient size. Optimal therapy in Hodgkin's disease requires 3500 to 4000 rads over a period of three and a half weeks since the risk of recurrence is inversely proportional to radiation dosage below this level. From a review of the literature Kaplan has found that the risk of recurrence in the field of treatment is 78 percent for dosage under 1000 rads, 48 percent for 1000 to 2000 rads, 26 percent for 2000 to 3000 rads, 12 percent for 3000 to 3500 rads and 4 percent for 3500 to 4000 rads.

Prophylactic irradiation (a misnomer since this therapy is aimed at undetected disease) has received much discussion. Certainly, the frequency of recurrence in lymph nodes clinically uninvolved but adjacent to those with disease indicates the need for including the former in treatment fields. Particularly when the primary process is in the neck or axilla, there can be little argument about treating the apparently uninvolved mediastinum, where detection of early disease is difficult. It should also be pointed out that it is much more satisfactory to radiate a single large area in continuity than several smaller fields the junctions of which may be either overirradiated or underirradiated. In practice, a mantle port (both cervical and axillary regions and the medastinum in continuity) is a suitable treatment field for Hodgkin's disease localized above the diaphragm; the upper abdomen may be added as a treatment field if the hilar lymph nodes are involved. For localized presentations in the groin treatment should include at least a bilateral pelvic field and a para-aortic field to the level of the diaphragm. In the latter situation irradiation of the mediastinum may also be advisable when high para-aortic nodes are diseased. Early recurrence or extension of disease should also be given extensive radiation. Lymphomas of other than Hodgkin's type are much less frequently localized, but when they are (particularly in cases of follicular lymphoma) an approach similar to that advocated for Hodgkin's disease is justified.

The proper treatment of Stage III Hodgkin's disease remains an open question. At least five additional years will be needed before it will be clear that the extensive radiotherapy required in such disseminated cases is justified. Without such data at present an attempt is made to extend definitive radiotherapy to as many Stage III cases as possible, including in particular patients who would have been Stage I or II but for the finding of retroperitoneal lymph nodes on lymphangiography, most younger patients without constitutional manifestations (Stage III-A) and many persons below the age of 50; those over the age of 50 with Stage III-B disease would tend to be excluded from such treatment. Chemotherapy, either by itself or preceded by radiotherapy, is an alternate approach of Stage III disease, but radiation should not be withheld if the known areas of disease can be encompassed within reasonable treatment fields.

In Stage IV Hodgkin's disease there is seldom hope of cure because of widespread involvement of radiosensitive normal tissues. In such cases chemotherapy is usually the primary method of management, and the goal is relief of symptoms. Occasionally, the anatomic involvement of parenchymal tissue is limited enough to justify an aggressive radiotherapeutic approach even in Stage IV disease. Likewise, an expeditious way to palliate a localized symptomatic area of adenopathy in Stage IV disease is often with radiotherapy, and this approach is also useful in Hodgkin's disease of lung parenchyma or bone.

Chemotherapy is of great value in Hodgkin's disease, but none of the presently available agents are curative, and in comparison to radiation, drug responses are of short duration. Several studies employing combination chemotherapy, which uses several agents in very toxic amounts in an attempt to alter the evolution of advanced cases of Hodgkin's disease (Stages III and IV), are now under way, but too few patients have been treated to indicate whether these regimens will have general applicability. Similarly, there is insufficient evidence on which to recommend prophylactic chemotherapy after definitive radiotherapy of localized disease.

Chemotherapy is employed (either in primary treatment or after radiotherapy failure) when treatment is needed and irradiation therapy is not suitable because of dissemination too widespread for irradiation, involvement of normal tissues of low radiation tolerance, exhaustion of normal tissue tolerance by prior radiotherapy or occasionally the requirement of a more extensive program of radiotherapy than the clinical situation warrants. Chemotherapy is preferred if the major areas of disease responsible for the disability cannot be irradiated. Systemic manifestations such as fever, night sweats, pruritus, anemia and severe weight loss are often added inducements for using systemic agents. Most such cases are Stage III or IV.

In most clinics the first chemotherapeutic agents employed are the alkylating drugs, either nitrogen mustard itself or its derivatives chlorambucil and cyclophosphamide, which can be given by mouth. When the alkylating agents lose their effectiveness, the periwinkle alkaloid vinblastine (Velban) and the methylhydrazine derivative procarbazine (Natulan) are used successively. Corticosteroids are reserved for special situations or when the more effective drugs have failed. Considerable judgment is needed to obtain the maximum benefit from a compound without undue toxicity and to discard a drug at the appropriate time when its benefits have been exhausted. The average duration of useful remission in Hodgkin's disease is about four to six

months for the alkylating agents and procarbazine and ten to twelve months for vinblastine, though such remissions have not been proved to represent an equivalent increase in survival.

Finally, it should be noted that the primary management of Hodgkin's disease is a sophisticated and difficult undertaking. Both an internist and a radiotherapist with interest in this disorder should participate in the initial evaluation of the patient, and lymphangiography, which is essential for the assessment of early disease, is technically demanding and requires experience in interpretation. Furthermore, the large treatment fields and high radiation dosage employed make special demands upon the radiotherapist and his equipment.

Since Hodgkin's disease is a relatively uncommon disorder as well as one with many clinical peculiarities, there is much to be said for concentration of its initial management in a few centers. This is particularly true for young patients with Stage I and II disease, in whom some radiotherapists believe the chance of cure is as high as 80 percent, and even advisable perhaps also for young people with Stage III-A disease. With the realization that the hopeless prognosis of Hodgkin's disease still found in some textbooks is incorrect, haphazard radiotherapy can no longer be justified. Procrastination, dilatory chemotherapy and irradiation to inadequate fields or in inadequate amounts can jeopardize the chance for cure. Hight cure rates in Hodgkin's disease have been reported only from centers that practice meticulous radiotherapy.

(The references may be seen in the original article.)

MATERNAL EXPOSURE TO POTENTIAL TERATOGENS

James J. Nora, MD, Audrey H. Nora, MD, Robert J. Sommerville, MD, Reba M. Hill, MD, and Dan G. McNamara, MD, JAMA 202(12):1065–1069, December 18, 1967.

A prospective study of 240 mothers observed until delivery reveals a high frequency of exposure to potential teratogens in the first trimester of pregnancy (mean exposure per mother, 3.7 potentially teratogenic agents). Although some exposures are unavoidable, the great majority of these exposures, including radiation and drugs, would be considered readily avoidable. The mean experience in the first trimester was 3.1 drug exposures per mother, which emphasizes not only that drug exposures are common, but that they are frequently multiple. Drugs used by the mothers were most often obtained by prescription. The significance of the role of teratogens in human malformations is not clearly established. However, until adequate information is available, it is appropriate to emphasize the magnitude of drug and other potentially teratogenic exposures to pregnant women and to enlist the support of physicians in the reduction of this exposure.

The role of teratogens in producing human malformations has been a justifiable source of concern. Considerable publicity has attended the few instances in which a well-documented causal relationship has been established between specific teratogens and human malformations. Thalidomide and rubella are outstanding examples. Many other potential teratogens have been suspected, scrutinized, and to a lesser extent publicized.

Suspicion of teratogenesis has been aroused by observing an association between exposure to a given agent and a malformation in humans or by experimental production of congenital defects in animals by selected agents. The next step, that of clearly demonstrating a causal relationship between the suspected teratogen and human malformation has not, with few exceptions, been successfully taken.

A method in which a high degree of confidence may be placed in documenting a causal relationship between a specific teratogen and a congenital malformation is the prospective study. In this preliminary report a prospective survey of 240 pregnant women has been performed, and their exposure during pregnancy to potential teratogens has been recorded.

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Read before the seventh annual meeting of the Teratology Society, Estes Park, Colo, May 25, 1967.

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Materials and Methods

At the hospitals affiliated with Baylor University College of Medicine and the University of Wisconsin, 240 mothers were contacted during their pregnancies and observed until delivery. A history was recorded on a code card designed to include (1) major groupings and specific designations of drugs in common use through prescription and nonprescription channels, (2) selected environmental hazards known to be or suspected of being teratogenic to man or other species, and (3) acute and chronic illnesses by specific diagnoses, symptoms, and signs. The history form contained 102 designations of potential teratogenic agents plus space for uncoded material. The contact was made with mothers at whatever stage of pregnancy they presented at their initial visit. A review of exposures prior to the visit was recorded, and additions were made to the teratogenic-history forms during subsequent visits until delivery. After delivery and before discharge from the nursery, the babies were examined for congenital defects. The majority of infants have not been reexamined following discharge from the nursery, except for 106 individuals of whom adequate follow-up has been possible for periods ranging from six months to three years. In 186 patients a satisfactory genetic history was obtained by inquiring specifically about the occurrence in the family of congenital malformations.

TABLE 1.—*Exposure to Potential Teratogens and Anomalies Encountered in 240 Mothers Observed Until Delivery*

	Potential Teratogen	
	First Trimester	Entire Pregnancy
Mothers exposed	118 (49%)	240 (100%)
Mean number exposures per mother (any potential teratogen)	3.7	6.3
Mean number exposures per mother (drugs)	3.1	5.4
Anomalies (major)	5 (2.1%)	8 (3.3%)
Anomalies (minor)	11 (4.6%)	18 (7.5%)
Congenital heart defects	2 (0.83%)	2 (0.83%)

Results

Table 1 documents that of the 240 mothers initially contacted and observed until delivery, 118 were exposed to what we defined as a potential teratogen during the first trimester. Few of these mothers had an exposure to only a single potentially teratogenic agent, except for one mother who had a chest x-ray film during her third week of pregnancy and several mothers who had respiratory infections for which no drugs were administered. Most mothers who received a medication received several drugs (mean maternal exposure, 3.1 drugs in first trimester). The mean number of potentially teratogenic exposures per mother in the first trimester, including infections and radiation, was 3.7.

By the end of their pregnancies we judged that every one of the mothers had received exposure to a potentially teratogenic agent. The mean number of drug exposures during pregnancy was 5.4 per mother, and the total mean number of potential teratogens was 6.3. From our present understanding of the timetable of human development we would not attach great significance to the latter figures which include events in the second and third trimesters, except to call attention to the large number of drug and other exposures that occur during pregnancy.

Major anomalies, defined by Smith and co-workers as anomalies of significance to the health and appearance or both of the patient, were detected in five (2.1 percent) offspring of mothers who had an exposure to a potential teratogen in the first trimester, and in three (1.3 percent) babies of mothers without such an exposure in the first trimester. A total of eight babies (3.3 percent) were observed to have major anomalies; all of which were detected in the nursery.

Minor anomalies were noted in 11 patients (4.6 percent) with a maternal exposure to a potential teratogen in the first trimester and in seven patients (2.9 percent) with an exposure in the second and third trimesters for a total of 18 patients (7.5 percent) judged to have anomalies of no significance to health and appearance or both.

There is no statistical difference between the number of patients with anomalies whose mothers were exposed to potential teratogens in the first trimester as compared to those not having a first trimester exposure ($P = 0.25 = 0.10$).

Two of the patients had congenital heart defects, both were in the first-trimester exposure group. The other patients with major anomalies found in the group exposed to potential teratogens in the first trimester were one patient each with talipes equinovarus, diaphragmatic hernia, and cleft lip and palate. A patient with mongolism was also encountered, but this was not attributed to a teratogenic exposure. Nine of the infants were premature by weight, three were considered postmature, and one was stillborn. Two sets of twins were delivered.

TABLE 2.— *Exposure to Selected Potential Teratogens in 240 Pregnancies*

Potential Teratogen	Exposure	
	First Trimester	Entire Pregnancy
Radiation	29(12%)	72(30%)
Appetite suppressants	31(13%)	65(27%)
Antiemetics	36(15%)	38(16%)
Tranquilizers	22(9.2%)	51(21%)
Analgesics	28(12%)	155(65%)
Antibiotics	29(12%)	101(42%)
Antihistamines	41(17%)	62(26%)
Insecticides	50(21%)	125(52%)
Acute illness	28(12%)	129(54%)
Vitamins *	156(65%)	214(89%)

* Not scored as teratogen when taken in normal quantities.

In Table 2, we have selected for illustrative purposes certain agents which have had suggestive evidence of teratogenic effect in humans or experimental animals. These agents, with the exception of acute illness, are largely avoidable. Represented are only ten of 102 categories or specific designations of agents which we coded as potentially teratogenic. (Vitamins in normal usage have not been recorded as teratogens.)

Radiation.—Twenty-nine mothers (12 percent) received radiation in some form during the first trimester. Two of the offspring had major anomalies, one with a first-trimester exposure and one with a second-trimester exposure. Radiation exposure occurred in 72 mothers (30 percent) at some time during their pregnancies. This experience is slightly higher, but comparable to that reported in a national survey by Brown et al. Three mothers received miniature chest roentgenograms, which were required for employment, at a vulnerable period during their pregnancies.

Appetite Suppressants.—During the first trimester 31 of the 240 mothers (13 percent) in the series took an appetite suppressant, most often dextroamphetamine sulfate, but phenmetrazine hydrochloride, diethylpropion hydrochloride, and chlorphentermine hydrochloride were also prescribed. By the end of their pregnancies 65 of the mothers (27 percent) had taken an appetite suppressant. In approximately one half of the patients taking dextroamphetamine, another drug was contained in the same capsule or tablet. Three of the eight mothers delivering babies with major malformations took an appetite suppressant in the first trimester, and one other mother of an infant with a major malformation took an appetite suppressant in the second trimester.

Antiemetics.—Thirty-eight mothers (16 percent) received antiemetics during their pregnancies. All but two had the exposure during the first trimester. Two children with major anomalies were delivered to mothers taking antiemetics in the first trimester. Meclizine hydrochloride, with and without pyridoxine, and dimenhydrinate were the most commonly used agents.

Tranquilizers.—A wide variety of drugs having central nervous system activity, especially for the relief of anxiety, were taken by 22 mothers (9.2 percent) in the first trimester and by 51 mothers (21 percent) at some time during their pregnancies. Three of the mothers taking tranquilizers had babies with major malformations, two had a first-trimester exposure, the other an exposure in the third trimester.

Analgesics.—Nonprescription preparations, mainly salicylates alone or in combination were used by 28 mothers (12 percent) in the first trimester and by 155 mothers (65 percent) during some stage of their pregnancies. Two mothers with first-trimester exposures to analgesics and three mothers with later exposures had infants with major anomalies.

Antibiotics.—Many different antimicrobial agents including tetracyclines, penicillins, sulfas, and chloramphenicol were taken by 29 mothers (12 percent) in the first trimester and ultimately by 101 mothers (42 percent) during their pregnancies. In the first-trimester antibiotic-exposure group one baby with a major anomaly was delivered, and three babies with major anomalies were born to mothers who had antibiotics during any trimester. Most of the antibiotics were taken for respiratory infections (24 mothers in the first trimester). It is difficult to make a retrospective judgment on the indications for antimicrobial therapy. However, in none of these 24 mothers was a throat culture obtained, and by symptoms, the present investigators were inclined to consider the respiratory infections to have been viral in nature. Because the percentage of respiratory infections which are bacterial in an open population is small (2.5 percent), this assumption is probably justifiable.

Antihistamines.—A first-trimester exposure to antihistamines was reported in 41 mothers (17 percent). Frequently a "stuffy nose," a not uncommon feature of early pregnancy, initiated the prescribing of medications from this group. Eventually 62 mothers (26 percent) took antihistamines at some time during their pregnancies. Two children with major anomalies were born to mothers who had first-trimester antihistamine exposures and one

infant to a mother with an exposure in the second trimester.

Insecticides.—Exposure to household, garden, and farm insecticides occurred in 50 mothers (21 percent) in the first trimester and eventually in 125 mothers (52 percent). The exposures were more common in patients living in the southern United States and in patients living on farms. Two infants with major malformations were born to mothers who had first-trimester exposures to insecticides and two others to mothers who had later exposures.

Acute Illness.—Twenty-eight mothers (12 percent) had some form of acute illness in the first trimester, and ultimately 129 mothers (54 percent) had acute illnesses during their pregnancies. Respiratory infections were the most common, and were followed in order by genitourinary and gastrointestinal infections. The mothers of two infants with major anomalies had a history of a first-trimester acute illness. One other infant with a major defect was delivered to a mother who had an acute illness in the third trimester.

Vitamins.—We recorded the number of mothers who took vitamin supplements during their pregnancies with the intention of scoring as potentially teratogenic exposures only those instances where the vitamins were taken in excess. What constituted an excess then became a problem. In the first trimester 156 mothers (65 percent) had started vitamin supplements and eventually 214 mothers (89 percent) took vitamins. With few exceptions the vitamins taken were a prenatal preparation used in the generally prescribed manner and thus, presumably, not in excess. However, the majority of mothers drank milk (vitamin supplemented) and were exposed to a number of "enriched" foods. All of the infants in the study who had major anomalies had a history of maternal vitamin-supplement exposure, but this has not been tabulated as a teratogenic exposure.

It is immediately obvious that multiple exposure to potential teratogens is the rule. Only five infants (excluding the patient with mongolism) had major anomalies in the first-trimester exposure group, yet in this group there were 17 potentially teratogenic exposures to the selected agents in Table 2 (vitamins not scored as teratogens). The mean number of first-trimester exposures to potential teratogens was 4.6 in patients who had major anomalies as compared with 3.7 in all patients in the survey.

The agents to which the mothers of the five children with major anomalies were exposed in the first trimester are recorded in Table 3. Again the multiplicity of exposure is emphasized, but no association is apparent between a specific anomaly and a specific agent.

TABLE 3.—*Potential Teratogens to which Mothers of Five Children With Major Anomalies Were Exposed in First Trimester*

Potential Teratogen	CHD 1 *	CHD 2 *	CL & P †	Diaphragmatic Hernia	Talipes Equinovarus
Radiation	+	—	—	—	—
Appetite suppressants	—	+	+	+	—
Antiemetics	—	—	—	+	+
Tranquilizers	—	+	—	+	—
Analgesics	+	—	+	—	—
Antibiotics	—	—	+	—	—
Antihistamines	+	—	—	+	—
Insecticides	—	+	—	—	+
Acute illness	+	—	+	—	—
Smoking 1 pack/day	+	—	+	—	—
Thyroid	—	+	—	+	—
Iron	—	—	—	—	+
Pyridoxine	—	—	—	+	—
Antispasmodic	—	—	—	+	—

* Congenital heart disease.
† Cleft lip and palate.

The genetic histories obtained on 186 of the 240 families provided the information that in 34 families (18 percent) there was a history of a known relative having some type of major congenital malformation. One of the two patients with congenital heart disease had a family history of congenital heart defects, but none of the other patients with major anomalies had a family history of the specific anomaly manifested in the infant. However, the patient with the cleft lip and palate had a cousin with a ventricular septal defect.

Comment

This study provides some positive findings and illustrates some problems. The most important positive finding is that pregnant women, despite the thalidomide scare, are still being exposed to a surprisingly high number of potential teratogens, many of which are avoidable. Drugs, most often by prescription, account for the majority of exposures.

The second positive finding is that exposures to potential teratogens are not usually single, but multiple. If a mother gets one medication, she is likely to get three medications or one medication made up of three ingredients. To isolate the effects of single agents or to distinguish possible synergistic effects of multiple agents becomes an immense task.

The problem of bias in these studies is not a small one. "Maternal-memory bias" is always an impor-

tant consideration. This bias is perhaps equalled by what we might term "investigator-interest bias." Our experience with the investigator bias has shown that the difference between obtaining or not obtaining a history of a familial disease or maternal teratogenic exposure is often related to the interest of the investigator in that problem and the amount of time and effort the investigator expends in obtaining the history.

The finding, for example, that 18 percent of the infants in the study had a family history of some type of congenital malformation should be accepted with reservation. While reasonably valid results may be achieved when carefully obtaining a history with a specific defect in mind, such as cleft lip, it is doubtful that reliable figures can be easily obtained from inquiries regarding such a broad area as congenital malformations. This is in part because enough of the right questions are not likely to be asked in a reasonable length of time.

To an extent, bias may be expected in taking a history for a large number of potential teratogens. While a physician may feel confident about the records of drugs he has prescribed for his patient and the illnesses he has attended, there may be a large number of exposures to drugs, illnesses, and other possible hazards of which the physician has no record. For this information the physician must rely on his history-taking skill and the cooperation and memory of his patient.

The time of initial contact with a mother in routine private- and charity-obstetrical practice influences the accuracy of recall for exposures. Only 125 of 240 mothers observed until delivery were seen in the first trimester (Table 4). Therefore, in a large number of patients, excessive reliance was placed on maternal memory for all potential teratogens, other than prescription drugs ordered by the physician who observed the patient until delivery. Another undesirable effect of the small number of mothers observed from early pregnancy is the lack of information gained on how many mothers had spontaneous abortions in the first months of pregnancy. This group of 240 mothers observed until delivery was taken from 303 mothers initially contacted. Of the 63 mothers not observed until delivery, we have verification of spontaneous abortion in only 14. We have evidence that 27 mothers moved or changed physicians, which left 22 mothers lost to follow-up evaluation.

It is clear, from this and previous studies, that it is most difficult to identify teratogens in human malformations. The multiplicity of exposures, recognized and unrecognized, together with the bias introduced by the subject and the investigator militate against confident conclusions. Although this investigation of 240 pregnancies does not provide evidence that maternal exposure to any of the numerous drugs and other potential teratogens caused malformations in these infants, it would be unjustified to assume that they are not capable of doing so.

TABLE 4.—*First Prenatal Visit*

Month of Gestation	No. of Mothers
First	38
Second	38
Third	49
Fourth	37
Fifth	22
Sixth	24
Seventh	4
Eighth	6
Ninth	22

Recent investigations reveal that many of the common congenital malformations in man conform to a pattern of multifactorial inheritance. In this mode of inheritance a teratogen may influence a developmental threshold in an individual with an hereditary predisposition to produce a malformation. Thus, maldevelopment may result from the simultaneous meeting of an individual with an hereditary predisposition for a given congenital defect, a sensitivity in that individual to a given drug or other teratogen, and an exposure at a vulnerable period in development (which may represent only hours or days in a nine-month gestation period).

We do not believe that there are a great many agents with the disastrous teratogenic potential of thalidomide or rubella. What we are trying to identify are agents which individually affect only small proportions of the population. The concern here is that there may be many such agents which are collectively responsible for a significant number of birth defects.

It becomes evident that either the number of patients needed to detect this sort of effect must be much larger or the experimental design must be much more precise. We have had the experience of selecting and intensively studying a single drug suspected on clinical grounds of producing malformation of the heart and have demonstrated in the mouse that it is highly capable of causing congenital heart defects. With our experimental design limited

to one drug and one malformation we did not find evidence of statistical significance to implicate this drug as a human teratogen. However, we were also unable to feel confident that this drug could not be responsible for human malformation, if it acted on individuals predisposed to the malformation and sensitive to the teratogenic effects of the drug.

Whether or not teratogens play a significant role in human malformation and whether or not convincing studies can be performed to define the nature and extent of this role is open to question. It is quite likely that the more useful area of investigation would be into the genetic-environmental interaction. However, until such time as sufficient information is available to make a valid judgment on these questions, it is appropriate to use what information we have in a way that is most likely to reduce congenital malformations.

Today, a large percentage of pregnant women continue to be exposed to drugs which are avoidable. We wish to emphasize the magnitude of drug exposure and urge involvement of physicians in the conscientious reduction of this exposure.

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Generic and Trade Names of Drugs

Dextroamphetamine sulfate—*Dexedrine Sulfate.*
Phenmetrazine hydrochloride—*Preludin.*
Diethylpropion hydrochloride—*Tenuate, Tepanil.*
Chlorphentermine hydrochloride—*Pre-Sate.*
Meclizine hydrochloride—*Bonadettes, Bonamine.*
Dimenhydrinate—*Dramamine.*

(The references may be seen in the original article.)

CONVULSIONS IN CHILDREN*

Sidney Carter, MD,† and Arnold Gold, MD,‡ New Eng J Med 278(6):315–317, February 8, 1968.

The frequent occurrence of convulsive seizures in the pediatric age group minimizes their true significance. Convulsions in infancy and childhood are not necessarily benign, and when prolonged may result in irreversible damage to the brain, with the production of additional epileptogenic foci and psychomotor retardation. In these patients worsening of the seizure state need not imply a progressive neurologic disease, but may be a reflection of the damage produced by the spells. Successful management of a convulsive disorder depends upon accurate identification of the seizure type, the delineation of etiologic factors and the proper use of anticonvulsants.

Etiology

The pathophysiology of convulsive seizures remains obscure. Biochemical and physiologic investigations, including production of epileptogenic foci by means of freezing lesions of the brain or the direct application of penicillin or alumina cream, have resulted in increased knowledge of basic mechanisms. Despite these obvious limitations, an etiologic classification of seizures as either idiopathic or symptomatic is of value in clinical management.

The age of the child is important in diagnosis. Recurring seizures before two years of age almost invariably indicates a symptomatic convulsive disorder. In such children seizures are associated with a variety of structural lesions of the brain or metabolic disturbances. Fever, a common triggering mechanism in the young child, can activate a latent seizure disorder or may be associated with isolated convulsions. With increasing age febrile reactions become less significant. In some older children a latent seizure state follows a variety of visual, auditory or tactile stimuli.

Idiopathic epilepsy implies a failure to document a structural or metabolic defect. With increasing knowledge and long-term evaluation a symptomatic

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etiology can be delineated in many idiopathic seizure states. Heredity is an important factor in idiopathic epilepsy, and even focal seizure disorders, long considered a manifestation of symptomatic epilepsy, may have a genetic basis.

Seizure Types

Physicians are aware of the classic seizure types, but in the pediatric age group frequently confuse or fail to recognize certain convulsive phenomena. The major motor attack or grand-mal convulsion is readily recognized. Less well defined are episodes whose manifestations are less dramatic.

Infantile myoclonic spasms, often confused with colic or teething, are usually evident before one year of age and commonly disappear by the age of two years. A symptom complex of diverse etiologies, these spells are characterized by lightning-fast myoclonic jerks and are almost invariably followed by significant psychomotor retardation.

The psychomotor attack, a frequent type of seizure in childhood, is often confused with the superficially similar petit-mal episode. The distinction has both therapeutic and prognostic significance. The presence of an aura, followed by stereotyped automatisms lasting for more than 30 seconds, with subsequent development of postictal confusion or lethargy, as well as the relative infrequency of spells, clearly differentiates the psychomotor from the petit-mal attack, which usually recurs several to many times daily, is not preceded by an aura and is not followed by any postictal phenomena. Psychomotor seizures may be related to a temporal lobe lesion whereas the petit-mal type is usually considered a manifestation of idiopathic epilepsy. Petit-mal can no longer be regarded as a benign disorder since a significant number of patients will continue to experience these episodes in later life, and in approximately 50 percent grand-mal attacks will develop. Children with normal intelligence and normal background activity on the electroencephalogram who show a good response to therapy before 10 years of age are least liable to grand-mal seizures.

Sensory-precipitated epilepsy (reflex epilepsy) is the name given to seizures that are triggered by sensory stimulation, usually of the special sense organs. Photic-induced spells result from repetitive flickers of light and are clinically observed in a child watching a poorly adjusted television set or exposed to flickering sunlight. Other forms of sensory-precipitated spells include those produced by sound or music, by reading and by light tapping over the head or shoulders. Attacks may take the form of the classic petit-mal episode or may be of the myoclonic or akinetic variety.

Recurrent headaches or abdominal pain may be the sole manifestation of a convulsive disorder. These episodes, of short duration, are associated with abnormalities on the electroencephalogram and are responsible to diphenylhydantoin (Dilantin). The diagnosis, which is often difficult, is made after all other etiologic conditions have been excluded.

Diagnosis

Diagnosis depends upon documentation of the seizure type and subsequent delineation of etiologic factors. Infantile spasms are associated with developmental defects and metabolic or degenerative disorders of the central nervous system. Their occurrence may be an early manifestation of phenylketonuria, and when they are associated with depigmented skin lesions, a diagnosis of tuberous sclerosis is possible. Hypoglycemia at any age can result in seizures. Neonatal hypoglycemia is no longer considered a benign entity. Postprandial convulsions have been related to leucine-induced hypoglycemia. Seizures in the fasting state, often attributed to idiopathic hypoglycemia, may be the result of a glycogen synthetase deficiency with inadequate glycogen stores or a pancreatic islet-cell adenoma.

Structural lesions resulting in epilepsy are either atrophic or expansive. The lesion can often be defined with new and improved technics. Transillumination of the infant skull may reveal subdural fluid collections or porencephaly. The electroencephalogram remains the most useful of the ancillary diagnostic procedures. Routine tracings may show nonspecific electrical abnormalities with or without paroxysmal discharges. Some abnormalities are highly specific for certain types of seizure, and others aid in localization. Three-per-second spike and wave discharges in petit-mal attacks, and hypsarhythmia in infantile spasms are highly diagnostic electrical patterns. Spike discharges in the temporal areas may be seen with psychomotor epilepsy. The value of the electroencephalogram as a diagnostic tool is often enhanced by sleep, stroboscopic and pentylenetetrazol (Metrazol) activation. Normal electroencephalograms do not exclude the diagnosis of epilepsy. Interpretation of electroencephalographic tracings in childhood is often difficult and requires a knowledge of the changing physiology that occurs in the developing brain. In selected children echoencephalography, radioisotope intra-

cranial localization tests and air or dye contrast studies may be of value in diagnosis.

Alteration of the state of consciousness in itself is not diagnostic of epilepsy. Breath-holding spells in infancy are often confused with a convulsive disorder. These spells always follow some precipitating factor, such as noxious stimuli, frustration or fear. The attack, initiated by a cry, is followed by loss of consciousness, with or without convulsive movements. The interictal electroencephalogram is characteristically normal, and breath-holding spells are refractory to anticonvulsants. Syncope, with transient loss of consciousness, is usually found in older children and must be differentiated from epilepsy.

Therapy

Etiology often determines management, and anticonvulsants are not required in all children with seizures: hypoparathyroidism is controlled with vitamin D; hypoglycemia may require dietary management, corticosteroids, glucagon, diazoxide, human growth hormone and, with islet-cell adenoma, a subtotal pancreatectomy; pyridoxine dependency or deficiency states are corrected with supplemental pyridoxine; and disorders of amino acid metabolism are treated with restricted diets. Specific antibiotic therapy is mandatory with bacterial infections of the central nervous system. Seizures associated with intracranial mass lesions usually require surgical extirpation as well as anticonvulsant medication. Although not specific, corticosteroids or corticotrophins are the most effective agents for infantile myoclonic spasms.

Anticonvulsants are necessary in the great majority of children with recurrent seizures. Approximately 50 percent of patients are seizure free with anticonvulsants, and partial control can be achieved in an additional 25 percent. Serious untoward reactions may limit the use of some of the more common and highly effective anticonvulsant drugs. Diphenylhydantoin, in addition to the troublesome gingival hyperplasia and hirsutism, has recently been shown to produce polyarthropathy, lymphadenopathy simulating a lymphoma, Raynaud's phenomenon and polyneuritis. Drug-induced lupus erythematosus may complicate therapy with diphenylhydantoin, mephenytoin (Mesantoin) and trimethadione (Tridione).

Since the available anticonvulsant compounds are not completely effective and may have serious side effects, new drugs are constantly being investigated. Recent additions to the therapeutic armamentarium include ethosuximide (Zarontin) and diazepam (Valium). Ethosuximide is the drug of choice in petit-mal attacks, being effective and less toxic than the other compounds. Diazepam, administered parenterally, may be therapeutic in status epilepticus without producing the undesirable lethargy and respiratory depression associated with barbiturates and paraldehyde. Experimental drugs showing some promise include nitrazepam (Mogadon) in infantile myoclonic spasms and akinetic attacks, tetrahydro-2-p-sulfamoylphenyl-1, 2-thiazine-1, 1-dioxide (Ospolot) in psychomotor epilepsy and carbamazepine (Tegretol) in grand-mal epilepsy. The ketogenic diet (high in fat and low in carbohydrate) may control minor motor seizures which are often refractory to drug therapy.

Surgery is of limited value in the treatment of epilepsy. Temporal lobectomy is useful in selected patients with uncontrolled psychomotor epilepsy. Hemispherectomy is employed in the syndrome of refractory seizures associated with infantile hemiplegia and a behavior disorder. In such cases the convulsive attacks and the undesirable behavior are usually benefited without worsening of the hemiparesis. Increased intracranial pressure secondary to repeated hemorrhages, recently described as a complication of this surgical procedure, usually occurs years after the hemispherectomy.

The past decade has seen some changes in social attitudes toward the epileptic patient. In enlightened communities children with seizures are now more readily accepted by schools and are permitted to participate in the usual activities for their age group. In many states the teen-ager with seizure control may obtain a driver's license. Unfortunately, progress is too slow, and currently there are many obstacles that must be faced by the epileptic child.

MEDICAL ABSTRACTS

CHRONIC URTICARIA: A CLINICAL STUDY OF FIFTY PATIENTS

D. A. Miller MD, G. L. Freeman MD, and LCOL W. A. Akers MC, Amer J Med 44(1):68–86, Jan 1968.

In a series of fifty consecutive cases of chronic urticaria nearly all patients were found to have more than one etiologic mechanism contributing to perpetuation of their illness. A flexible scheme of progressive evaluation to detect drug allergy, inhalant urticaria, food allergy, infections, cholinergic skin disease, dermographism, physical allergy, "collagen vascular disease" and psychogenic urticaria is presented. An adequate history and physical examination will rule out other specific types of urticaria such as hereditary angioedema and urticaria pigmentosa. Extensive search for possible underlying malignancy may be necessary, especially if cold-precipitating proteins are present in the blood. The association of cryofibrinogenemia with cold urticaria is further documented. To obtain a satisfactory therapeutic response, contributing factors such as dry skin disease, contactants and thyroid disorders must be treated.

LEPTOSPIROSIS I

L. H. Turner, Trans Roy Soc Trop Med Hyg 61(6):842–855, 1967.

During the last 20 years leptospiral infections have been found in many countries where they were unsuspected; they occur in man, his pets and livestock and in a wide variety of wild animals. The statement that leptospirosis is probably the world's most widespread contemporary zoonosis (van der Hoeden, 1964) is no exaggeration.

Many clinicians (medical and veterinary), public health workers and bacteriologists seem to be unaware of the advances in our knowledge of *Leptospira* and leptospirosis. An attempt is therefore made in this article to give a brief account of various aspects of the subject in the hope that some popular misconceptions will be set right and that further interest will be stimulated.

Diagnosis of acute leptospirosis on the basis of clinical impressions is unreliable: there is a variety of manifestations which occur in different combinations, especially in man. Leptospirosis may mimic other acute infections and is liable to be overlooked in differential diagnosis.

Diagnosis is not difficult, however, if suitable specimens are submitted for laboratory investigations. Moreover, though some of these investigations depend on the availability of a large number of strains of *Leptospira*, or of other reagents, and on specialized experience, others are within the scope of any general-duty bacteriology and serology laboratory.

THE SURGICAL MANAGEMENT OF PATIENTS WITH MELANOMA

H. B. Lehr MD, H. P. Royster MD, H. T. Enterline MD, and S. I. Askovitz MD, Plast Reconstr Surg 40(5):475–481, Nov 1967.

The surgical management of patients with cutaneous melanoma who were treated at the Hospital of the University of Pennsylvania from 1940 through 1961 forms the basis of this report. The patients are divided into two groups: patients with a diagnosis of superficial melanoma and those with a diagnosis of malignant melanoma. The latter group is further divided into patients who were admitted with advanced disease, or who refused treatment, and patients who were admitted for definitive treatment designed to control the disease. The group of patients admitted for definitive treatment were managed by two general methods. All patients had a radical local excision at the site of the malignant melanoma. In some patients, a regional node dissection was done more than a month after the diagnosis of melanoma was made, when palpable or suspicious regional lymph nodes developed. In the other group of patients, a concurrent regional node dissection was done within 1 month of the pathologic diagnosis of melanoma, whether or not palpable lymph nodes were present in the regional lymph draining areas.

The case records of the patients are examined retrospectively to see if one pattern of treatment offers a distinct advantage.

COMMON SENSE (CLINICAL JUDGMENT) IN THE DIAGNOSIS AND ANTIBIOTIC THERAPY OF ETIOLOGICALLY UNDEFINED INFECTIONS

Louis Weinstein PhD MD, Pediat Clin N Amer 15(1):141–156, Feb 1968.

Even in the absence of microbiologic proof of the identity of an organism and of its sensitivity to

various antimicrobial agents, the exercise of common sense may be of very great help in diagnosis and treatment. The frustration of the physician faced by an etiologically undefined infection, and his attempt to alleviate this by the empiric use of one or more antibiotics, are frequently unwarranted. Detailed examination of the epidemiologic background of such disease and of the manner in which it starts and progresses, together with knowledge of the types of organisms most frequently responsible for specific infections in various areas of the body, makes possible an etiologic diagnosis which time and laboratory study often prove correct. On these bases of such information, selection and use of an antibiotic agent become rational, relatively precise and, therefore, potentially beneficial.

Whether the etiologic background of an infection is determined on clinical grounds alone or by microbiologic studies, the choice and use of antibiotics involve consideration of a number of features that determine their safe applicability and ultimate effectiveness. The degree of antimicrobial activity of a drug must never be the only basis for its use. Its potential for producing untoward effects, the ease and route of its administration, the type of patient to whom it is given, the length of time over which it will be required, as well as its cost, are equally important considerations. It must be stressed that diagnostic and therapeutic dilemmas can often be resolved by careful clinical evaluation and that the all-out antibiotic attack with its risks of undertreatment and reactions is a very poor substitute for the exercise of common sense.

DENTAL SECTION

CRYOTHERAPY FOR BENIGN LESIONS OF THE ORAL CAVITY

G. B. Emmings, S. W. Koepf, and A. A. Gage, J Oral Surg 23:320–326, July 1967.

Cryotherapy, or treatment by extreme cold, was used by the authors to treat hemangioma, mixed tumor, papillary epithelial hyperplasia and hyperkeratosis. The apparatus used forces liquid nitrogen into the noninsulated tip of a probe which is applied to the lesion prior to cooling. As the tissue begins to freeze, it becomes adherent to the probe. Large lesions may require several applications of the probe so that the frozen areas overlap. The mechanism of cell death upon freezing may be that intracellular ice crystals destroy cell membranes or disrupt cellular constituents as a result of their different coefficients of thermal contraction. Or it may be that freezing first occurs extracellularly, with water being drawn out of the cells thereby increasing the electrolyte concentration and producing cell injury and death. Whatever the mechanism, the frozen tissue becomes necrotic and sloughs. The inflammatory response and discomfort are usually slight.

(Abstracted by: CAPT Howard S. Kramer, Jr., DC USN.)

PERSONNEL AND PROFESSIONAL NOTES

POSTDOCTORAL FELLOWSHIP PROGRAM

Description: The Postdoctoral Fellowship is a program of inservice learning principally for junior officers to obtain earlier advanced training than is possible by awaiting assignment to the Naval Dental School. It should be pointed out that enrollment in a fellowship does not preclude assignment to the Naval Dental School at a later date. The clinical specialty fellowships are similar in content but less vigorous than a first year level (residency) training in the various specialties of dentistry.

Specialties: Postdoctoral Fellowships are available in the clinical fields of periodontology, prosthodontics, endodontics, oral surgery, and oral pathology. Research and Dental education/preventive dentistry fellowships are also available.

Location: Fellowship sites are not fixed and may change from year to year depending on unique

requirements and availability of preceptors. The following tentative sites may be established for 28 participants in the Postdoctoral Fellowship Program for Fiscal Year 1969:

NH Great Lakes	Oral Surgery
NH Pendleton	Oral Surgery
NH Charleston	Oral Surgery
NH Orlando	Oral Surgery
NH Long Beach	Oral Surgery
NDC Norfolk	Oral surgery
NH Jacksonville	Oral Surgery
NH Camp Lejeune	Oral Surgery
NAS Jacksonville	Prosthodontics
NDC Long Beach	Prosthodontics
NDC Washington, D.C.	Prosthodontics
NDC Norfolk	Prosthodontics
Naval Academy	Prosthodontics
NDC Washington, D.C.	Periodontics
NDC Charleston	Periodontics
NDC Norfolk	Periodontics
MCRD San Diego	Endodontics
NTC San Diego	Endodontics
2nd MAR DIV Camp Lejeune	Endodontics
NDC Washington, D.C.	Endodontics
NDS Bethesda	Oral Medicine
NDS Bethesda	Oral Pathology
NMRI Bethesda	Research
Naval Dental Center, San Diego	Prev Dent/Dent Educ

Objectives: The fellowship program has a twofold aim: first, to provide the junior officer an earlier opportunity for advanced study than he would have by awaiting assignment to the Graduate or Postgraduate Courses at the Naval Dental School. In this respect the fellowship program may be considered as the equivalent prerequisite for other advanced training in exceptional cases. A number of dental officers approved for long courses at civilian Universities commencing in FY 1969 were selected from Postdoctoral Fellowships. A second aim of the fellowship program is to provide a building block of interest and education for the general practitioner. The completion of the fellowship does not classify the trainee as a specialist.

Scope: This program is designed as an academic period of study, clinical training, teaching experience or research with neither prerequisites nor accreditation toward specialty board certification. In the clinical fields, two or three special cases should be prepared in detail for presentation to the staff. A thesis based either on special cases or on research, and a literature search should be encouraged but not required.

Prerequisites: Applicants must hold a commission in the Dental Corps of the Regular Navy and must have completed a tour of duty at sea or in areas considered foreign shore for rotational purposes. Seniority is not a consideration for assignment to a postdoctoral fellowship.

Quota Control: Applicants are considered by the Bureau of Medicine and Surgery Dental Training Committee on a competitive basis reflected by their academic and service records.

Active Duty Following Fellowship: An agreement is required to not resign during the course and to serve in the Navy for at least one year after completion of the Fellowship.

Enrollment in the Postdoctoral Fellowship Program does not preclude enrollment in the Graduate or Postgraduate courses, Naval Dental School, at a later date. Officers may include in their application a preference site for fellowship training which would be considered by this Bureau in making the assignment following acceptance into the program.

Submission of Requests for Training: Applications for postdoctoral fellowships or any long courses of instruction must be received in this Bureau at least three weeks prior to the deadline of 1 December 1968, for courses commencing in the academic year, 1969, in accordance with MANMED article 6–130 (Change 40).

NAVAL DENTAL CENTER INAUGURATES NEW SYSTEM

The Dental Technician School, a part of the Naval Dental Center, San Diego, California, put into operation recently a completely new computerized testing system.

The system, which replaces the old porta—punch method, involves the use of an optical mark reader (IBM 1232A) and a key punch (IBM 534).

Among its advantages are error free evaluation, tremendous time saving and complete up-dating of all student records.

The student marks his answers on the test form with a number two pencil. The form is fed into the optical mark reader which is hooked-up to the key punch. The reader and key punch operate simultaneously, the reader scanning the forms for errors while the key punch feeds out the IBM card with the appropriate holes punched in it. The IBM card is then fed into a computer (IBM 1401).

This computer, in typewritten form, gives the following information: the results of each individual's test; which questions each individual had in-

correct; composite data on how many times each question was missed; and an up-dating of each student's records.

The complete process, for each individual test, takes only eight minutes and is 100 percent error-free. It has reduced the instructor's testing time over the porta—punch method by 25 percent and over the manual method by 75 percent. This leaves the instructors with much more time to devote to individual student counseling and test evaluation.

Members of DT School Staff originated this plan for the School. Senior Chief Dental Technician H. B. Walton, Assistant Director for Training Support, spearheaded the drive for the new system. First Class Dental Technician Gordon C. Fillmore, an instructor at DT School, is the main operator of the data processing equipment. The optical mark reader and key punch are both operated by DT School personnel.

The machines used by DT personnel are located at the Naval Supply Center. John Roberts, Project Co-ordinator in the Data Processing Department at the Naval Supply Center coordinated the plan for DT School.

ROLE OF THE NAVAL DENTAL CORPS IN INTERNATIONAL HEALTH AND UNDERSTANDING

The U.S. Naval Dental Corps actively engages in a continuous program to foster better international good will and understanding and to assist friendly foreign nations in advancing the profession of dentistry.

In all foreign countries where the Naval Dental Corps maintains activities, dental officers participate in dental society meetings and seminars to help advance the dental education and training of foreign dentists. This includes the Naval Dental activities sponsoring and conducting dental meetings and seminars for foreign dental societies.

When situations develop in foreign countries which result in mass casualties, Naval Dental Officers assist the Medical officers and local authorities in rendering first aid and assist in providing instruments and supplies to help alleviate humanitarian problems. In many instances, dental personnel volunteer their off-duty hours to assisting orphanages with their dental health problems.

The Naval Dental Corps provides observership training ranging from one to six months for dental officers of the Armed Forces of friendly nations. Spaces are made available to dental technicians of foreign countries in the four month General Dental Technician School and in the six month Prosthetics Dental Technician School.

Spaces are made available to the Royal Canadian Dental Corps in short postgraduate courses conducted at the Naval Dental School. The Naval Dental Corps has also assisted the Royal Canadian Dental Corps School in setting up their course in casualty care treatment.

Correspondence courses administered by the Naval Dental School for the Naval Dental Corps have been made available to members of the Armed Forces of friendly foreign nations. Also, many excess professional textbooks and periodicals have been donated to foreign dental schools and dental societies.

The Naval Dental Corps has provided a limited number of dental exhibits and films for presentation at dental society meetings in foreign countries.

Visiting dentists and dental groups from foreign countries are briefed by the Naval Dental Corps and conducted on tours of our various dental facilities according to the intent of the visit and the nature of the request.

NURSE CORPS SECTION

TO ALL NURSE CORPS OFFICERS ON THEIR SIXTIETH ANNIVERSARY

On the occasion of the Sixtieth Anniversary of the Navy Nurse Corps, I wish to convey warm personal regards and deep appreciation for your dedicated and loyal support.

The past year has added another chapter of outstanding professional achievements to the glorious history of your Corps. During these troubled days in Southeast Asia you are answering the call of duty as Navy Nurses did in World War I, World

War II, and the Korean Conflict. You are meeting the nursing care needs of the sick and injured military men and their families in Navy medical activities throughout the world. On the battlefront in Vietnam, you are bringing the best possible care directly to those wounded in combat. I am happy to report to you that never have we provided more skilled, comprehensive patient care—and never have I witnessed a higher degree of dedication and devotion to our patients' needs.

Your resolute and unswerving commitment to your professional responsibilities, to your Team, and to your Command has been a source of strength in the achievement of the Medical Department's mission and an inspiration to us all. I am confident that, whatever the challenges of the future, Navy Nurses will continue the tradition of excellence which has been theirs since 1908.

I commend you for a job "Well Done" and send you my best wishes for a very Happy Birthday.

R.B. BROWN
Vice Admiral, MC, USN
Surgeon General

MESSAGE FROM DIRECTOR, NAVY NURSE CORPS

It is a pleasure and privilege to extend my cordial greetings and heartiest wishes to all Navy Nurses on the Sixtieth Anniversary of the Navy Nurse Corps.

As we look back the past six decades we can be justifiably proud of our heritage. Since 1908, Navy Nurses have met the challenge of their mission in peace and war, ashore, afloat, and in the air with dedication to duty, professional competency, and leadership ability second to none. As we celebrate our founding let us pay tribute to those who, through their service and sacrifice over the years, contributed so much to the professional growth and progress of our Corps.

Hardly a day passes that I do not hear of the outstanding professional nursing care the men and women of the Nurse Corps are providing to the members of the military services and their families throughout the free world. As Director of the Navy Nurse Corps, I take great pride in our accomplishments of the past year and am confident that we shall continue to meet our responsibilities in keeping with our distinguished record of achievement.

May the coming year be a rewarding one for each and every Navy Nurse. Well Done and a Happy Birthday.

s/Veronica M. Bulshefski
Captain, NC, USN
Director, Navy Nurse Corps

PREVENTIVE MEDICINE SECTION

TETANUS PROPHYLAXIS

Globulin, tetanus immune (human) (FSN 6505–890–1975) is an effective and safe material for passive immunizations against tetanus. Its use is encouraged in lieu of tetanus antitoxin from non-human sources. The human source globulin advantages over equine or bovine tetanus antitoxin (TAT) in that sensitivity testing is not required, protective antibody levels are significantly prolonged and active immunization with tetanus toxoid can be begun immediately in the tetanus exposed unvaccinated patient. The availability of tetanus immune globulin in no way reduces the need for active immunization, which remains preferable to all forms of passive protection. The program for active immunization with tetanus toxoid will continue as specified (BUMEDINST 6230.1 series).

The recommended complete prophylactic measures for injured personnel are as follows:

a. All wounds should receive effective surgical debridement as soon as possible.

b. Completely vaccinated patients should receive a toxoid booster.

c. Unvaccinated or incompletely vaccinated patients should receive a dose of tetanus toxoid, followed by completion of active immunization.

(1) Tetanus immune globulin of human origin should be given intramuscularly. The recommended dose is 250 units (1cc). It should not be given intravenously and should not be injected at the same site as the tetanus toxoid.

(2) Antibiotics such as penicillin and tetracycline have been shown to be effective against vegetative tetanus bacilli, both *in vitro* and in experimental animals. They have no effect against toxin. The effectiveness of antibiotics for prophylaxis remains unproved and, if used, they should be given over a period of at least five days.—Commun Dis Br, Prev Med Div, BuMed.

MALARIA SURVEILLANCE IN THE UNITED STATES, 1967: A PRELIMINARY REPORT

Vector Control Briefs, Issue No. 21, Feb 1968.

Two thousand six hundred seven cases of malaria in the U.S. and Puerto Rico for 1967 have been reported to the Malaria Surveillance Unit, National Communicable Disease Center, Atlanta. Military personnel (including recently discharged veterans) accounted for 2,487 cases and non-military persons (civilians) for 120 cases. The number of civilian cases is comparable to that seen in the previous year, whereas the number of military-associated cases has shown a 5-fold increase. All but 7 of the 2,607 cases acquired their infection abroad. Two thousand four hundred eighty-three of the military cases acquired their infection while stationed in Vietnam, 117 other foreign countries, and 7 in U.S.

Malaria in the United States, 1963–1967

Year	Military	Civilian	Total
1963	58	90	148
1964	52	119	171
1965	51	105	156
1966	563	115	678
1967 (preliminary)	2,487	120	2,607

The species of Plasmodium was identified in 2,537 of the 2,607 cases (97.3%). *Plasmodium vivax* was diagnosed in 2,138 cases (84.2%); *P. falciparum* in 327 cases (12.9%); *P. ovale* in 17 cases (0.7%); *P. malariae* in 13 cases (0.5%); and mixed infections were found in 42 cases (1.7%).

Among the 120 civilian cases, 22 cases occurred in former Peace Corps volunteers, all but 2 became infected in Africa. Seventeen cases were reported in seamen, and 13 cases in returned tourists. Foreign visitors to the U.S. accounted for 27 cases of malaria.

Only 1 fatal case of malaria, *P. falciparum*, was reported; a civilian flight engineer who died 8 days after his return to the U.S.

Only 7 cases of malaria acquired their infection in the United States, as follows:

a. Two servicemen developed *vivax* malaria at Ft. Campbell, Ky., one on June 8, the other on July 1, 1967. Neither had ever been in malarious areas, nor did they have a history of blood transfusions, commonly shared syringes, or unexplained episodes of fever. *Anopheles quadrimaculatus* adults and larvae were found in the area of the 2 men's sleeping quarters. The source of infection was considered to be a serviceman returned from Vietnam, who had experienced multiple attacks of *vivax* malaria during a 2-month period while housed near the patients' barrack.

b. A case of congenital malaria due to *P. malariae* occurred in California.

c. Malaria infection caused by *P. falciparum* was diagnosed in a resident of San Francisco who had received two blood transfusions 8 days prior to the onset of his fevers. One of the donors was a serviceman returned from Vietnam, who had a clinical history of malaria and whose serum was positive for *P. falciparum* in the fluorescent antibody test.

d. A 55-year-old woman in New York City had been hospitalized for treatment of idiopathic thrombocytopenia. She received platelet transfusions from 121 donors, and 7 units of whole blood. Subsequently, she developed chills and fever, and *P. ovale* parasites were found in peripheral blood. One of the donors was a Nigerian student whose serum was positive for malaria in the fluorescent antibody tests.

e. An 8-month-old infant in Connecticut had a 5-month history of recurrent fevers. Examination of peripheral blood smears revealed the presence of *P. malariae* parasites. The infant had never been abroad, but had received 2 exchange transfusions during the first 36 hours of life. One of the blood donors was a Mexican immigrant whose serum was positive in the fluorescent antibody test for malaria.

f. A cryptic case of malaria due to *P. vivax* was diagnosed in a civilian resident of Kentucky, who had never been abroad and had no history of blood transfusions, commonly shared syringes, or unexplained fever episodes. Epidemiologic investigations did not uncover any additional cases of malaria in the area. Accordingly, this isolated case of malaria was classified as cryptic.

g. It is of interest that, despite the large number of imported malaria cases in 1967, only 3 cases could conceivably be attributed to infection via mosquito transmission in the United States; i.e., the 2 introduced cases and possible the cryptic case of malaria.

MALARIA RISK IN MEN RETURNING FROM VIETNAM

Modern Medicine, p 84, Feb. 12, 1968.

The appropriate treatment of the malaria which may develop in Vietnam returnees depends on species identification of the parasite. The disease usually strikes within two months after the patient returns to the states, often while he is under the care of a civilian physician. The symptoms include fever, chills, headaches, muscle and low back pain, and usually moderate splenomegaly. Malaria parasites in peripheral blood smears confirm diagnosis.

Records of 100 army hospital servicemen seen during a three-month period show that 60% had *Plasmodium falciparum* type malaria in Vietnam and were cured. When these same patients had a malarial recurrence after coming home, it was usually the *Plasmodium vivax* infection, temporarily suppressed in Vietnam. *P. falciparum* malaria should be treated with quinine sulfate, sulfadiazine, and pyrimethamine (Daraprim), since these men probably have previously received chloroquine, to which this parasite is resistant. Concurrent infection with *P. falciparum* should be suspected and additional therapy instituted when a patient being treated for *P. vivax* with chloroquine and primaquine has a fever after three days of therapy.

MENINGOCOCCAL INFECTIONS—1967

USDHEW PHS NCDC Morb and Mort Wkly Rpt 4:33, Jan 27, 1968.

During 1967, 2,164 cases of meningococcal infection were reported to NCDC, Atlanta, Ga. This was a decrease of 36% from the 3,381 cases reported during 1966. The incidence rates from June through Dec 1967 were the lowest observed since 1960, and the incidence rates for each month were lower than those for comparable months in 1966. The usual seasonal upward trend in monthly rates became apparent in Oct 1967, and further increases may be expected in the first quarter of 1968.

Meningococcal infections among military personnel and their dependents decreased approximately 60% from the 1966 total of 331 cases to 131 cases in 1967. These 131 cases represent 6.1% of the cases reported in 1967; in contrast, in 1966, the military-associated cases comprised 9.8% of the reported cases.

In 1967, 367 strains of *Neisseria meningitidis* were submitted to NCDC, Atlanta for laboratory analysis. These strains have been isolated mainly from blood or spinal fluid of patients. Consistent with the findings in recent years, the predominant serogroup was group B. Of 356 meningococcal strains subjected to sulfadiazine sensitivity tests, 157 strains (42.3%) were not inhabited by 1.0 mg. % of sulfadiazine. In 1966, 40% of the strains tested were not inhabited by a similar concentration of sulfadiazine.

FOOD SANITATION REFERENCE

1. The attention of Environmental Sanitation Officers is invited to the recent publication of the

Sanitation-Safety Section F of the "Food Operations Reference Manual", FORM (NAVSUP Publication 421). The Sanitation-Safety Section of FORM affords a useful tool for didactic and on-the-job training in food sanitation.

2. The Sanitation-Safety Section F is composed of seven parts as follows:

I. Scope of a Food Sanitation Program
II. Food Microbiology
III. Food-Borne Diseases and Food Poisoning
IV. Facilities and Supplies for Cleaning and Sanitizing
V. Standards and Directions for Cleaning and Sanitizing
VI. Safety in Food Service and Food Storage Handling
VII. Food Service Operations in Nuclear, Biological, or Chemical Warfare

3. Of singular value to medical department personnel is the useful integration of medical and supply department responsibilities for food hygiene and safety measures employed in food preparation procedures. A unique chapter is Part VII: Food Service Operations in Nuclear, Biological, and Chemical Warfare.

4. The Sanitation-Safety Section F can be procured as COG I-Stock No. 0530–138–0102. The publication can be ordered on DOD MILSTRIP Form DD–1348 (1961), submitted to either the Naval Supply Center, Oakland, California 94625 or the Naval Supply Center, Norfolk, Virginia 23512.—Sanitation Sec, Prev Med Div, BuMed.

FOOD-BORNE DISEASE OUTBREAKS CAUSED BY CLOSTRIDIUM PERFRINGENS

Bull Epid, Commonwealth of Va. Dept of Health, Mar 9, 1968.

Reports of outbreaks of food-borne illness caused by *Clostridium perfringens* are becoming increasingly frequent as more laboratories employ anaerobic methods in their routine examination of outbreak foods.

The clinical illness caused by *C. perfringens,* although not unique, is easily recognized. The incubation period is 8 to 22 hours with a median of about 12 hours. There are cramps, abdominal pain, and diarrhea without tenesmus. Nausea and vomiting are rare, and there is no fever or other signs of infection. Recovery is usually complete within 24 hours. *The foods most often involved are meats, meat dishes, and gravies that have been mishandled in such a manner as to allow an incubation period of several hours at a relatively high temperature. A* knowledge of these factors allows the epidemiologist, in many instances, to give the laboratory a well substantiated hint that *C. perfringens* may be involved. This hint may be partially confirmed by the laboratory from the results of a gram-stained smear of the food homogenate, which will show many large gram-positive rods without spores.

MEASLES—UNITED STATES, 1967

USDHEW PHS NCDC Morb and Mort Wkly Rpt 19(3):22, 28, Jan 20, 1967.

For the first time since reporting of measles began on a national basis (1912), the reported cases in 1967 were fewer than 100 per 100,000 population. In 1967, the case rate per 100,000 population was 37.4 as compared to 104.2 in 1966.

The frequency distribution of the states according to the reported measles cases per 100,000 population for calendar years 1966 and 1967 is shown in Table 1. The primary difference between 1966 and 1967 occurs in the high and low levels; there was essentially no change by individual states to a different rate category in the 2 years.

In 1967, 29 states, the District of Columbia, and New York City showed marked decreases in reported cases of measles per 100,000 population from the 1966 reports. This is reflected by the maps in Figures 2 and 3 not shown; 10 states showed a decrease in rates, but the decrease was not enough to show improvement on the maps from 1966 to 1967. An increase in case rates over 1966 was noted in 11 states. However, only 2 (Oklahoma and Nebraska) showed increases of magnitude to change to a different classification on the maps. In some of these 11 states, the higher rates are due to improved reporting.

Of the 18 states with reported measles cases of 100 or greater per 100,000 population in 1966, three (North Dakota, Texas, and Washington)

TABLE 1.—*Frequency Distribution of States * According to Reported Measles Cases per 100,000 Population*

Cases per 100,000 population	Number of States	
	1967	1966
Less than 25.0	25	11
25.0 to 49.9	10	9
50.0 to 99.9	13	14
100.0 or greater	4	18

* Includes the District of Columbia and New York City.

showed case rates greater than 100 in 1967. In 1966, the case rates ranged from 103.7 to 738.5 for these 18 states. In 1967, the case rates for the 4 states with a rate greater than 100 per 100,000 population ranged from 122.9 to 184.2.

In 1967, of the 25 states reporting fewer than 25 measles cases per 100,000 population, 16 (64%) had rates less than 10; of the 11 states in 1966 with a rate less than 25, 5 (45%) reported fewer cases than 10 per 100,000 population.

A TWENTY-FIVE-YEAR FOLLOW-UP OF CONGENITAL RUBELLA

M. A. Menser, et al, Lancet II(7530):1347–1350, Dec 23, 1967.

Fifty patients with congenital rubella, born in New South Wales after the rubella epidemic which reached its peak in 1940, were assessed. Forty-eight were deaf; 26 had typical cataracts or chorioretinopathy, and 2 had small undiagnosed lens opacities; 25 were below the 10th percentile for weight and/or height, and 20 had minor skeletal defects; 11 had congenital cardiovascular defects, 3 had systemic arterial hypertension, and 1 had undiagnosed diabetes mellitus. Six of 22 males had undescended testes and 1 female had vaginal stenosis. Of 11 married patients, 7 had reproduced 8 children, of whom 7 were normal and 1 had congenital rubella. A striking feature was the good socioeconomic adjustment made by most patients. Mental deficiency was to be of average intelligence, and 2 had completed their education at a tertiary diploma level. At the time of interview only 4 were unemployed, including 1 controlled schizophrenic. The developmental potential of many patients had been assessed erroneously during the pre-school period.

KORO EPIDEMIC IN SINGAPORE

USDHEW PHS NCDC Veterinary Public Health Notes, p 5, Nov 1967.

An outbreak of a little-publicized disease, which in this instance may have been a zoonosis, was recently reported from Singapore. The disease—"koro." No figures were given as to how many were suffering from this illness caused by hyperactive imaginations and the wildly spreading rumor that a man who eats pork from pigs that had been vaccinated against swine fever will have his most obvious evidence of masculinity shrink into the oblivion of his abdomen. Death may ensue—whether from anxiety, displacement of vital organs, or from self-inflicted preventive measures carried out with string, tongs, etc., is not stated.

"Koro"—or "Shook Jong" to the Chinese—was first described by Blonk in 1895. The name means "shrivelling," and while the report from Singapore mentioned only that neurotics of the male variety were besieging government hospitals and private clinics with yin-over-yang complaints, women are also said to suffer from the shrinking effects of "koro."

That the scare was real, even if the disease is not, is evidenced by the fact that the number of pork eaters in Singapore dwindled for a time there from an estimated 1,600,000 to only a few hundred. Big restaurants even stopped offering pork to their customers.

The treatment, according to a senior government medical officer, is to give the patient a glass of water and assurance that the trouble is intellectual not sexual and that everything will come out all right.

A COMMUNITY EPIDEMIC OF COCCIDIOIDOMYCOSIS

P. L. Roberts and R. C. Lisciandro, Amer Rev Resp Dis 96(4):766–772, Oct 1967.

An epidemic of coccidioidomycosis involved 10 children within a 2-block area of a military housing project. The clinical illness was mild in all of the children: 2 had acute coccidioidal pneumonia; 1 had residual pulmonary granulomas. This is consistent with the usual benign course of primary infection with *C. immitis*. Residual pulmonary lesions, as exemplified by one child, may cause diagnostic dilemmas that frequently cannot be resolved without thoracotomy. It was suggested that infection was contracted while the children were playing and digging in the immediate area of soil found to harbor *C. immitis*. Other factors must be invoked to explain the high proportion of coccidioidin reactors among the parents of these children with documented primary coccidioidomycosis. It is suggested that arthrospores may have been taken home on the childrens' clothing; wind-borne dissemination cannot be completely excluded, due to the proximity of the positive soil to the involved households. A 5% incidence of coccidioidin skin reactors was found in the community; 73% of these reactors lived within the area of the epidemic.

Did You Know?

That "black death" outbreaks of 1605, 1625, 1636 and in 1665 wiped out 68,000 lives in a population of less than ½ million?

The epidemic continued in England in a slower pace into 1666. Londoners owe a debt of gratitude to a little bakery in Pudding Lane near the London Bridge. The shop caught fire in the early hours of Sunday, 2 Sept 1666 and the Great London Fire which followed destroyed ⅘ths of the walled city and millions of rats and their breeding places. London has not experienced a major outbreak of plague since.

Too late the city's authorities recalled reports of plague epidemics in Palestine and Syria. In Marseille, France, in August 1721, 39,000 of the total population of 90,000 died from plague. Before the pestilence had run its course through the environs of Marseilles, 88,000 lives had been wiped out.[1]

That during 1965 and 1966, 373 cases of diphtheria were reported in the United States?

One hundred sixty-four cases for 1965 were the lowest ever reported in 1 year in the United States.[2]

That reduction of DDT residue levels permitted in food would not affect sales of the pesticide?

Food and Drug Administration and the U.S. Dept of Agriculture have jointly proposed a drop in permitted residue levels from the current 7 parts per million on a wide variety of fruits and vegetables. The agencies say this shows more DDT was used than needed for adequate pest control; plans are to allow only 3.5 ppm on some products and 1 ppm on others. However, little DDT is used on foodstuffs; the insecticide's major market is cotton, which is unaffected by the FDA-USDA proposal.[3]

That about 2.4 million persons, or 1.3% of the civilian, noninstitutional U.S. population were known diabetics as of June 1965 according to the National Center for Health statistics?

Another 1.6 million or more persons are estimated to have diabetes but are unaware of their condition. Prevalence is highest in women. The incidence increases with age in both sexes, reaching a peak in the 65 to 74-year age group, where the rate is 60.6 per 1,000 population for women and 47.1 for men. Most diabetics had at least one other chronic condition.[4]

That one acre of land may harbor as many as 400,000 insects, with bees, hornets, yellow-jackets and wasps constituting the most common threat?

Allergic reactions leading to hives, wheezing and even shock can result in persons allergic to certain insect secretions; fatalities are sometimes mistakenly attributed to heart attacks induced by fright. Children and adults should wear shoes in warm weather to avoid being stung by stepping on bees. Hair lotions, cosmetics, suede and rough, bright-colored clothing all attract bees.[5]

That in most highly developed countries, infant mortality rate is about 15 per 1,000 population, whereas in some underdeveloped countries it is still between 150 to 300 per 1,000.[6]

That only 12.5% of 770 patients in the National Leprosarium in Carville, Louisiana, who were born in the endemic states of Florida, Louisiana and Texas, give a history of a preceding case of leprosy in a member of the immediate family?

Of these 3 endemic states, Louisiana consistently has the highest incidence of leprosy. Among the 294 patients born in that state only 15% had immediate family contacts with the disease; 18% had contact with infected related family members. Of this subgroup of 294 patients, 76% had contact only with cases in the community. Extra-familial sources of infection are further supported by the infrequency of multiple cases within one family.[7]

Seven hundred lives are lost per year in the U.S. from pedal cycling accidents?

It is estimated that from 120,000 to 150,000 persons sustain disabling injuries from such accidents in a single year.[8]

That a synthetic juvenile hormone, a compound that controls yellow-fever mosquito, is effective against *Pediculus humanus*, a kind of body louse that carries with it the threat of typhus epidemics?

A synthetic juvenile hormone is lethal to both adults and to live unhatched eggs. Eggs were placed on wool and nylon pads treated with the hormones; in every case, less than 25% survived. Control tests on the same kind of padding treated with peanut oil, hatched about 65% of the time. Exposure to synthetic juvenile hormone in varying concentrations also kills adult lice and inhibits normal sexual developments of nymphs. The Harvard School of Public Health investigators report in the July Proceedings of the National Academy of Sciences their findings and state that lice have become immune to most insecticides.[9]

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4. Modern Medicine 36(5): 56, Feb 26, 1968.
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6. WHO Chronicle 21(12): 506, Dec 1967.
7. Los Angeles County Health Dept Morb & Mort Rpt Dis, p. 1, Mar 9, 1968.
8. USDHEW PHS Public Health Rpt 83(1): 68, Jan 1968.
9. Science News 92(7): 163, Aug 12, 1967.

EDITOR'S SECTION

AWARDS AND HONORS

Navy Cross
Valdez, Phil I., HM3 USN

Silver Star
Brown, Charles F., HM3 USN
Kelsey, John F., HM2 USN
Laning, John E., HM3 USN
Mertlich, Dale E., HM3 USN
Simmons, Travis A., Jr., HM2 USNR
Suarez-Lugo, Orlando (N), HMC USN

Legion of Merit
Knapp, Robert W., LCDR MC USN
Snyder, William A., CAPT MC USN

Navy and Marine Corps Medal
Poole, Charles R., HM1 USN

Bronze Star
Burke, Francis W., CAPT MC USN
Conner, Donald L., HM3 USN
Cooper, Paul D., Jr., CDR MC USN
D'amato, Samual L., Jr., LT MC USN
Eckhart, Gerald L., HM1 USN
Gonder, Floyd S., Jr., LT MC USN
Gough, Galal S., LT MC USNR
Hopping, Donald W., CDR MC USN
Kinney, Richard L., HN USN
Monaco, Martin L., HMCS USN
Scott, John A., HM3 USN
Zarriello, Jerry J., CAPT MC USN
Ziegler, Thomas W., LT MC USN

Navy Commendation Medal
Beam, Donald J., HM3 USN
Bramhall, Perry D., HM3 USN
Dinsmore, Harry H., CAPT MC USN
Gross, Theodore D., LT MC USNR
Johnson, Jay A., LT MSC USN
Keating, James P., LT MC USNR
Kolde, Joseph A., HMC USN
Lowe, William B., Jr., HM3 USN
Martin, Richard E., HM1 USN
Moffitt, Bayard L., LT MC USNR
Morgan, Guy H., CAPT MSC USN
Sell, Robert R., HM2 USN
Teselle, Gary C., HM2 USNR
Thompson, Lester K., CAPT MSC USN
Wade, William R., HMC USN
Waldron, Lester E., HMC USN
Walker, Byran L., LT MC USNR

Navy Achievement Medal
Henri, Clarence R., HM1 USN
Higgins, Robert W., LT MC USNR
Hurst, Carolyn J., HM1 USN
Martinez, Roque C., HM1 USN

Joint Service Commendation Medal
Diebner, William E., LT MSC USN

Letter of Commendation
Eveland, Richard L., DT1 USN
Farrell, Joseph L., HM2 USN
Smith, Steven L., HM2 USN
Walton, Harry B., Jr., DTCS USN

CLEFT PALATE CLINIC AT BETHESDA NAVAL HOSPITAL

A notice in the U.S. Navy Medical News Letter, Vol. 51, No. 4, described the establishment of a cleft palate clinic at the Chelsea Naval Hospital. The notice stated that it was believed that this was the first such clinic in the Navy and one of the very few in the United States.

CAPT William C. Trier, MC USN (Ret), former chief of Plastic Surgery, points out that a cleft palate clinic was established at the Bethesda Naval Hospital approximately three years ago. The clinic at Bethesda was a cooperative enterprise involving the plastic surgery service, the maxillofacial prosthetic branch of the Naval Dental School, oral diagnosis, oral surgery, other interested departments in the Naval Dental School, and occasionally interested medical officers from the otolaryngology service and other clinical services.

Orthodontic treatment, which is not provided in the Navy, was represented by Dr. Peter Coccaro, an orthodontist at the National Institute of Dental Research at NIH in Bethesda. Dr. Coccaro was able to treat a number of the children seen at Bethesda through the kind auspices of the National Institute of Dental Research. Dr. James Lore provided services in both speech pathology and in psychology. A full-time speech pathologist at Bethesda Naval Hospital, Dr. Rex Naylor, began seeing patients in September 1966, and served as a member of the cleft palate team from then on. CAPT James Lepley, DC USN, (Ret), was the original maxillofacial prosthodontist who cooperated in helping to set up the cleft palate clinic.

MSC EDUCATIONAL ACHIEVEMENT

A significant number of Medical Service Corps officers are taking advantage of the educational opportunities available. Approximately 100 Medical Service Corps officers are currently enrolled in full-time duty under instruction in various inservice and outservice educational institutions. In addition, approximately 200 officers, representing the majority of the sections of the Corps, are enrolled this semester in part-time, off-duty courses of instruction. This is a significant increase in enrollment over the Fall Semester.

An encouraging number of this group represent officers, other than those in the Supply and Administration Section, who are completing certain prerequisites for their Master's or doctoral programs. As usual, however, more than 90% of those officers pursuing part-time, off-duty courses are in the Supply and Administration Section and are pursuing their degree after graduation from the Naval School of Hospital Administration or pursuing their educational program to enhance their selection opportunity for that course.

It is particularly encouraging to note that a large number of officers have pursued their degree programs immediately following the program at NSHA. All of the below named officers are graduates of NSHA and continued their degree programs and were awarded degrees as indicated at the Winter Convocation at The George Washington University in February 1968.

Doctor of Philosophy (Entomology)

LT John A. Mulrennan Jr., MSC USN
Duty Station: Naval Support Activity, DaNang

Master of Science (Personnel Administration)

LT Robert F. McCullagh, MSC USN
Duty Station: BUMED

Bachelor of Business Administration

LCDR James C. Curto, MSC USN
Duty Station: BUMED
LCDR Victor A. Swindall, MSC USN
Duty Station: BUMED

Bachelor of Arts

LCDR James F. DeWitt, MSC USN
Duty Station: NH, Bethesda
LT Verne W. Hagstrom, MSC USN
Duty Station: NH, Annapolis
LT John R. Knight, MSC USN
Duty Station: NH, Portsmouth, Va.

Bachelor of Science

LT John A. Boyle, Jr., MSC USN
Duty Station: NH, Bethesda
LT Thomas Delaney, MSC USN
Duty Station: NH, Bremerton
LT Floyd D. Saine, Jr., MSC USN
Duty Station: NH, Philadelphia

—MSC Div, BuMed.

AEROMEDICAL EVACUATION FLIGHTS LEAVING PACIFIC AREA

CDR Howard, ASMRO, indicating that there are presently 21 subject flights leaving the Pacific area. They are as follows:

Leaves from:	Clark AFB	Monday
Stops at:	Yokota	
	Elmendorf AFB	
	Andrews AFB	
Leaves from:	Clark AFB	Tuesday,
Stops at:	Yokota	Thursday, and
	Elmendorf AFB	Saturday
	Andrews AFB	
	McGuire AFB	
Leaves from:	Cam Ronh Bay	Sunday and
Stops at:	Yokota	Wednesday
	Elmendorf AFB	
	Andrews AFB	
Leaves from:	Saigon	Tuesday and
Stops at:	Yokota	Thursday
	Elmendorf AFB	
	Andrews AFB	
Leaves from:	DaNang	Sunday,
Stops at:	Yokota	Wednesday,
	Elmendorf AFB	Friday, and
	Scott AFB	Saturday
	Andrews AFB	
Leaves from:	Clark AFB	Friday
Stops at:	Yokota	
	Travis AFB	
Leaves from:	DaNang	Sunday,
Stops at:	Clark AFB	Tuesday, and
	Guam	Thursday
	Hickam AFB	
	Travis AFB	
Leaves from:	Cam Ronh Bay	Friday
Stops at:	Yokota	
	Travis AFB	

Leaves from:	Saigon	Sunday,
Stops at:	Yokota	Wednesday, and
	Travis AFB	Saturday
Leaves from:	Yokota	Monday—
Stops at:	Travis AFB	(Burn flight)
	Kelley AFB, Texas	

—Patient Affairs Branch, BuMed.

GEN L. F. CHAPMAN, JR. PRAISES THE UNITED STATES MARINE CORPS AND NAVY MEDICAL DEPARTMENT

Over the years and in many places throughout the world, the United States Marine Corps and the Navy Medical Department have served together in the defense of our country and the principles of freedom. Their relationship has traditionally been one rich in mutual respect and admiration, and the feeling continues unabated during this present conflict.

This camaraderie was simply and forcefully expressed recently when the Commandant of the Marine Corps forwarded to the Surgeon General of the Navy a letter he had received from a grateful father praising the fine medical care given his son when he was seriously wounded in Vietnam. General Chapman closed by saying, "I concur wholeheartedly, and I speak for all Marines who go into battle armed with their faith, their weapon and accompanied by their corpsman."

AFIP PRESENTS SPECIAL COURSE

The Armed Forces Institute of Pathology will present a special course titled "Special Environmental Pathology—Southeast Asia" from 20–24 May 1968. The program will be a comprehensive report on military requirements of a pathologist in an overseas area. Emphasis will be on such subjects as infectious, parasitic, and tropical diseases, wound ballistics, accidents by land, sea and air, and collection of research material on exotic diseases.

Registration is open to medical, dental, veterinary and allied sciences personnel, military and civilian. Write: The Director, ATTN: MEDEM-PAD, Armed Forces Institute of Pathology, Washington, D.C. 20305.

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